

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Pennypacker's Portable Hoist.

We illustrate upon this page two forms of portable hoist by M. Pennypacker, of the Baldwin Locomotive Works, Philadelphia, Pa. Fig. 1 shows the form designed for traversing, suspended by wheels on a rail or beam. A side view with a section of the lower part is shown. In Fig. 2 we have a view of the portable form of the apparatus available for use at any point by means of a swivel hook at the top. The apparatus consists of a central box, affording bearings for a wheel carrying winding sheaves on its opposite sides, over which a double winding chain is made to operate. Through the direct attachment of the chain wheels, by means of clutches and a clamp bolt, shafts and keys are entirely dispensed with, and as the wheels are the only part liable to wear out, the repair of the machine is correspondingly facilitated. The use of double chain for heavy lifts precludes the necessity for using the large chains that are now required when it is the purpose to obtain strength of section. A double extent of wearing surface is likewise presented on the chain and sheaves, while the load is equally distributed on all its bearings, thereby reducing the friction to a minimum, preventing unequal and indirect wear and strains, and greatly increasing the strength and durability of the whole apparatus. Either of the two chains indicated is strong enough to sustain the load, and as they are independent of each other, more speed is attained than by the usual construction of differential hoists. They can be replaced by longer or shorter chains when required by simply removing them from the sheaves; and as the hand chain is independent of the lifting chain, it does not accumulate at foot as the weight is raised. The hoist will sustain its load at any desired point, but under no circumstances can it run down. It will lower rapidly as soon as started. The screw and wheel being encased in a tight box are kept free from dirt and dust, the former revolving in a chamber filled with oil. The mechanical efficacy of this hoist is such that one man can lift without difficulty 4000 pounds.

The apparatus as constructed with the swivel attachment is similar to that used as a traversing hoist, and is made in three sizes, for 2000 pound, 4000 pound and 6000 pound lifts. It can also be used from a low ceiling, as the hoist is shorter than those now generally employed, and the lifting hook travels up to the machine. It is a valuable feature, too, that either hoist can be applied and controlled at any angle, thereby enabling workmen to stand from under the ascending load.

The other advantages claimed for the apparatus are, that it is simple, strong and powerful, combining cheapness of construction with durability and efficiency. It is likewise easy to keep in repair, and perfectly safe to the workmen handling it.

"Old Colony" Iron Cutters.

The iron cutter illustrated upon this page presents many features of especial interest. The principle employed is that of Broadbrook's mechanical movement of the rolling wedge and the compound lever. The rolling wedge is between the cam-shaped lever and cutter head, and works in grooves or corrugations. Upon the lowering of the lever it is caused to move forward in the direction of the pivot, or fulcrum, and as the distance diminishes between the resistance and the fulcrum, the power, or leverage, is constantly increasing. This mechanical movement is one of enormous power, and on this account is very valuable in the production of a good iron cutting machine.

These machines are made in sizes varying from those intended to cut sheet metal and rods up to $\frac{1}{2}$ of an inch in diameter, up to those able to cut bar iron 3 inches wide by $\frac{1}{2}$ of an inch thick.

The No. 10 machine for cutting bar iron, is 14 inches long, 11 inches high and 5 inches wide, occupying but little space on a bench or block. Weight, 110 lbs. Lever handle, 3 feet long. It cuts readily iron up to $\frac{1}{2}$ inch thick and $2\frac{1}{4}$ inches wide at one stroke of the lever, and also iron $\frac{1}{4}$ inch square, or steel $\frac{1}{4}$ by 1 inch. Two forms are illustrated; in each, however, the principles are the same.

In Fig. 1 there is a special arrangement for cutting off round iron which is omitted in the one shown in Fig. 2. The latter machine is designed for smaller and lighter work than the other. In both cases the frames and levers are of cast steel, very neat in design and very strong. The castings themselves seem to be exceptionally fine. The cutters are secured by screws, so that they can be easily replaced or taken out for grinding. The arm by which the two levers are connected has various notches for the purpose of adjustment, so that when a small piece of iron is to be the leverage it can be reduced, and the work done more rapidly than would be possible were the same speed and opening of jaw used for all sizes and kinds of metal. In Fig. 2 a small strap will be observed upon the cutting jaw, this holds the rolling wedge in place. These

iron cutters are manufactured by the Old Colony Rivet Works, New York warehouse, 34 Warren street. It may not be out of place to say that the prices of these machines are exceedingly low, a No. 3 machine, capable of cutting 5-16 in. diameter sheet metal, costing but \$20.

The Brooklyn Bridge.

Chief Engineer Roebling has presented his annual report to the trustees. The following were the principal facts: The small quantity

the cable itself emerging eight feet below the top of the masonry. In all previous wire bridges each cable was composed of seven strands. In this they contain nineteen, requiring thirty-eight bars for their attachment. These bars are of iron, as preferable to steel for such a use. Investigations at the Pittsburgh and Niagara bridges have shown that the old style of preserving the chains is safe, viz.: painting the chemically-cleaned surface of the iron and then imbedding the chain in hydraulic cement. The rusting power of Brooklyn air is twenty fold that of Cincinnati. The main cables are

ern Iron Boatbuilding Company's Works, in South St. Louis, formerly of New York city, undertook the construction of a railroad car exclusively of iron. The car is an ordinary platform or flat car, and was built more as an experiment than anything else. It is thirty feet long and nine feet wide, and built entirely of iron, with the exception of the flooring, which is of $1\frac{1}{4}$ inch oak planks. It is of a very neat shape, with slightly curved sides and round corners. The body as well as the truck frames are of wrought iron, and so constructed as to convince one of its strength as well as its dura-

"A young woman suddenly flounces in her seat and throws up her arms, and exclaims to her fellow travelers, through a companion: 'Did you ever know anything so hot? I'm stifling. Can't you open this window? Whew! whew! O dear! it's dreadful, isn't it? It's always so in these cars. My! It's awful!' On one occasion, when this kind of remark had been made at some length for the edification of the company, a voice was heard from the other end of the car: 'Yes'm, it's awful. But let's try to bear up. 'Tain't nothin' to the sufferin's of the early Christians.' A general laugh followed and nothing further was heard from that young woman."

Hardware and Iron at San Francisco.

The *Commercial Herald*, of San Francisco, in its annual review of the trade of that city, says concerning hardware, iron and steel:

We had occasion in our last two annual reviews to speak of the hardware trade in rather discouraging terms, the excessive importations of previous years, a constantly declining market, the numerous failures, and the low and unremunerative prices—all having conspired to produce unusual depression in the ranks. Some of these elements have been felt, though in a lesser degree, during the past year, but the general result for the year's business will be far more satisfactory to all concerned than either of its predecessors. The volume of business transacted has been larger, some of the leading houses having sold more goods in a single month than in any three in previous years. The profits, although light and cut down to a very small margin, have yet been an improvement in this respect, that the business has been less disturbed by sharp declines in the East, and a greater discrimination exercised in granting credits, producing a corresponding increase in profits. The numerous failures in the ranks, and the extinction of old established houses thereby, have had the effect of making the rest of the trade more conservative, and of attending more strictly to their own legitimate business while shunning outside investments, and the days when a greenhorn could hoist his shingle in the backwoods, come to "Frisco" and buy all the goods he could ship away on his own terms are happily at an end. Collections are made much closer than ever before, and country buyers who want ninety days and take four months are not sought after with avidity. This is one of the results of the trade settling into the hands of practical hardware men who understand their business and attend to it. With a few exceptions, prices have ruled steady during the year. Nails opened at \$4 rates, sold as low as \$3.25, and closed firm at \$3.75, with very light stock on hand and on the way. Imports for the year were 170,000 kegs as compared with 227,915 kegs in 1875 and 214,994 kegs in 1874. The number of kegs on the way at the opening of the year was 59,345, and the amount at present will not exceed 8000 kegs, the quantity on hand at date being less than for many years past. The Parker Mills, of Wareham, Mass., have been shut down most of the year, thereby causing a scarcity of this favorite brand, and giving the Western nail manufacturers a firm footing in the market. Screws have not been a profitable article of merchandise, the discount having ranged all the way from 40 to 60 per cent., closing at 50 per cent. The list on locks underwent a remodeling, making common rim and mortise locks about 15 per cent. cheaper, and the better grades of mortise locks about 10 per cent. higher. Planes, hammers, chisels and most kinds of carpenters' tools have declined from 5 to 10 per cent. We noted last year the introduction of Leland's axe, pick and sledge handles. The demand during the season was very satisfactory, the agent reporting sales of some 2000 dozen axe and 1000 dozen assorted. In the line of small tacks, nails, &c., we note a decided inroad made by Hobart's goods, which for years have been the standard in the shoe finder's business, but have only recently been sold by the hardware trade. We noted in our last review that the well known house of Pillsbury, Webb & Co. were closing out. Just before the new year the business was purchased by James E. Gordon, for nearly 15 years head salesman with Linforth, Kellogg & Co., and their predecessors, L. B. Benckley & Co., and well and favorably known to the trade. The old firm of Thomas H. Selby & Co. has been reorganized, and will be continued under the same firm name. Van Winkle & Davenport have dissolved and are succeeded by I. S. Van Winkle & Co. The last two firms, although classed as hardware, are more particularly dealers in iron and steel. The price of bar iron has been well sustained during the year, owing to the combination. This, however, having been broken in December, the price is now open and is ruling at about 3 cent rates. The combination netted the trade a handsome profit, which from now on will be lost. The outlook for 1877 is rather discouraging, there having been no rain during November and December; but notwithstanding we hear of stock orders fully up to the average having been placed for spring trade.

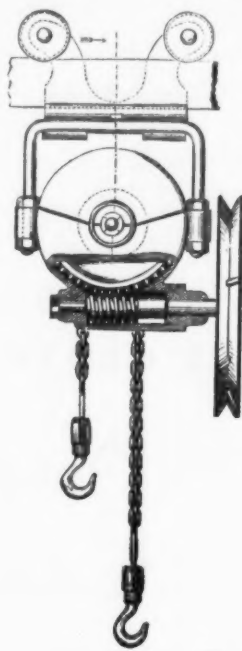


Fig. 1.

PENNPACKER'S PORTABLE HOIST.

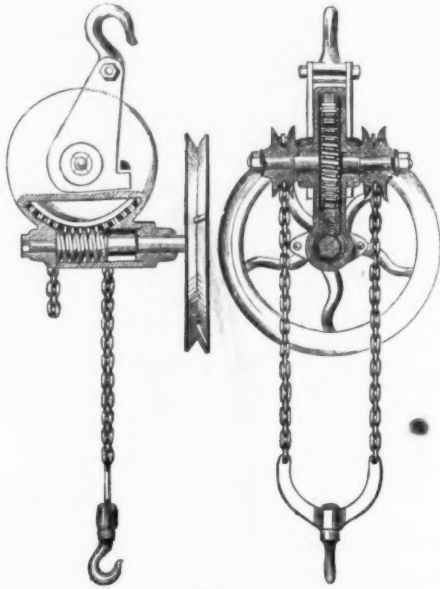


Fig. 2.



Fig. 1.

"OLD COLONY" IRON CUTTERS.



Fig. 2.

the Brooklyn tower were completed in the spring of 1874. The keystones, blocks weighing eleven tons, were fitted in without trimming, which showed great accuracy of measurement at the quarry and in the adjustment of the joints. On the completion of the tower the saddle and saddle-plates, which are twice as heavy as those at Cincinnati, were raised and put in place without accident. The resistance offered by the weight of the masonry on the plates against the upward pull of the chains affords a margin of safety of two and one-half times. This figure seems small compared with those of the main cables, where the margin of safety is about six times. But in the anchorage only two factors have to be considered—granite and gravity. The anchor chains are so disposed as to form the quadrant of a circle from a point of 20 feet above the anchor-plate to within 25 feet of the front of the anchorage,

taneously, and are put five or six feet above their destination to make allowance for all depressions. It will take about three years to make the main cables. It took nine months to lay 1,000,000 pounds of wire at Cincinnati. Preparations have been making for cable-laying for two years. As soon as the foot-bridge is completed all will be ready. Access will be had to the cradles of the regulators by this bridge, which will be 210 feet above the water. To protect such a frail structure against storms is no easy task, and Mr. Roebling predicts that the temporary works will be disabled more than once before the cables are finished. Inverted parabolic ston-cables serve to prevent the foot-bridge from being carried away bodily.

Iron Railroad Cars.—From the *Globe-Democrat* we learn that a few weeks ago Mr. Theodore Allen, superintendent of the West-

and test the carrying capacity of the car. It weighed without the brakes, 14,850 pounds, and with the brakes it is calculated to weigh about 15,000 pounds. It was deferred testing the carrying capacity of the car until the brakes could be applied, or until a day or two, when the car will be loaded with steel rails from the Bessemer Steel Works, and sent out over the Missouri Pacific Road. The gentlemen who viewed the iron car appeared much pleased with its construction, and expressed themselves in a manner which would indicate that the experiment so far was a decided success. Many of the railroad officials of St. Louis have awaited the construction of this car with decided interest, and iron cars are speedily expected to take the place of wooden ones.

Martyrdom.—Mr. George William Curtis, talking of railway manners, tells this story:

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SEE PAGE 9.

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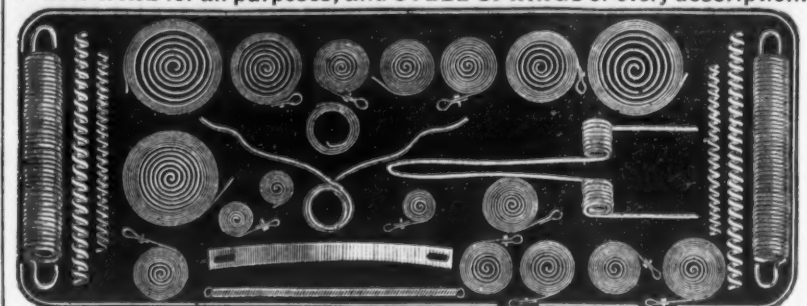
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It is also for sale in 1, 5 and 10 lb. packages by Hardware Dealers generally throughout the country.

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By this process oxygen is imparted to the blast simply by its passage, on its way to the place of combustion, through a chamber or vessel holding an oxygen compound, from which, by the agitation of the air thereon, oxygen is set free and thus imparted to the blast. The required volume of this blast is one-half less. The combustion becomes perfect therefrom, all the carbon in the fuel being converted into a high and concentrated heat, without smoke or gas, but that of carbonic acid, being formed. Beside a saving of fuel, obtainable in all cases by this blast, advantages arise from it varying according to the appliance of the heat. — On Forge Fires it gives a clean and intense heat, free from all sulphurous gas, whereby a better and quicker welding is had and time saved. On fires under boilers for making steam, the saving in fuel is 25 per cent. and over, the working capacity can be increased in same ratio by reason of the intensified and accelerated combustion, which latter also overcomes the disadvantages connected with the use of fine dust and impure coal. Castings from a cupola in which the fire is sustained by this blast become of superior quality, uniformly soft to work and very tough, resembling wrought iron and steel; they forge hot and cold to some extent; the iron becomes strengthened and purified, being freed from carbon and sulphur. For blast furnaces this process becomes of vast importance—it saves fuel, increases the working capacity, perfects and reduces the cost of the metal, makes sulphurous and other impure ores fit for use. The serious drawbacks arising from imperfect combustion, caused mainly by otherwise uncontrollable atmospheric influences, are overcome. The work of a puddling furnace and that of decarbonizing the iron, both for wrought iron and steel purposes generally, is much simplified, shortened and perfected as to purity of product; the work of so many hours is reduced to as many minutes by this process. The process has the merit of being simple and easily applied, and with but very little expense, and this only for the needed chamber or vessel and its connection with the blast pipe; the vessel may be a wooden keg, barrel or larger cask or tank, properly lined, from two gallons for a single forge fire up to 500 gallons and over, according to the blast in use. The cost of the oxygen is conditioned by, and made subject to, its effect—it is but a small item compared to the gains from it. Although this process has been in practical use for over a year, the inventor felt reluctant to offer it to the public before having its utility and practicability fully established, beyond any and all contingencies, not from a theoretical standpoint, but from the testimony of manufacturers who have used the process this last year, and whose standing and reputation as manufacturers are of the highest order, and such as to entitle them to the consideration of others. For further information, and for small specimens of castings from this process, address

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Dr. Nott's Heating Stove.

Our illustration shows a form of heating stove invented by Dr. Nott, of Union College, Schenectady, N. Y. The original of our illustration is still in use in the college and does good service. In this city (New York) there are a considerable number of them in private houses, apparently as satisfactory in their action as when they were put up, perhaps 40 years ago. The illustration represents one of the largest kinds, which, if we remember rightly, was called the Statue Flue, from the statuette which was placed in the arch between the flues. From the floor to the top of the stove was something like 8 feet or more, and the weight was something enormous, six or seven men being required to handle such a stove even when the flues were separated from the fire-box, as they had to be when the stove was moved.

The body of the stove was a square iron box lined with heavy fire-brick. At the bottom of this box is a semi-cylindrical grate with the bars running around it. When turned upside down the fire was dumped as in the modern form of grate. The draught was not directly up through the coal, but across the bottom of the fire to a flue upon the back side separated from the fire-box by what was called a flue brick. Coal was fed into the stove by raising one of the flat oblong covers seen on the top of the fire-box. The products



DR. NOTT'S HEATING STOVE.

of combustion passed up at the back of the box behind the flue brick, and so into the perpendicular flues upon each side of the statuette. These flues were of cast iron ornamented profusely like the stove itself. In the smaller stoves the hot air then passed directly into the smoke pipe, which went directly into the top. In this form the smoke is carried from the top down through the side pipes, which were united by elbows near the base, and connected with the pipe, which leads directly upward to the chimney, and is seen rising from behind from the top. The thick fire-bricks, base burning fire, convex form of grate, enormous radiating surface in the flues, and the general mechanical ability displayed in arranging the details, rendered this stove a powerful, economical and convenient heater, and one which can compete very well with some of the best base burners of the present day.

All the castings for these stoves were made in England and brought here to be fitted up. The pokers and shaking bars were also made on the other side of the water, and were very creditable pieces of workmanship, beautifully polished and very good in design; in this respect they were much better than the cast iron abortions too often sent out at the present day. In hunting up the history of this old stove, and attempting to get some insight into its construction, we went to Dr. Nott's old stove warehouse, 242 Water Street, in this city, now carried on under the style of Shepard & Co. We found a great variety of the old stoves and castings and repairs of all descriptions, for, strange as it may seem to the younger members of the trade, repairs for these old stoves are still needed, and every fall orders are sent in for them. This shows that their use is by no means limited, because they were so thoroughly well made, and the parts so well protected that they wear out very slowly. Messrs. Shepard & Co. use up many of the old castings in making cylinder stoves, and in various other ways work them off. At their place we found a great many curious and interesting things in regard to early stoves and stove making, and we propose to give our readers the benefit of our knowledge at some future time, illustrating our remarks with cuts of stoves and parts which will be of great interest. We were both surprised and amused upon our visit to find the germs of many of our modern "frills" had been used years ago by the ingenious and long headed president of Union College.

The Anti-Clinker Grate Suits.

Since publishing the extract from the Troy Times, relative to the new aspects of the anti-clinker litigation, our attention has been called to the following statement of Messrs. Perry & Co. We give it equal prominence:

Editors of the Albany Morning Express: The statements contained in the article copied in

your issue of this morning from the Troy Times, in respect to the "anti-clinker" question, are not based upon the truth.

First. The suit commenced against us is not for \$100,000, or any other fixed sum. The amount, if anything, can only be ascertained at the end of a decree and an accounting.

Second. It is not true that "James Spear, of Philadelphia, conceived a plan several years ago for the manufacture of a stove grate, the peculiar feature of which was its 'anti-clinker' property;" but, on the contrary, it is true that Spear copied this construction from prior inventions which belong to us, and then claimed it as his own.

Third. It is not true that "Elihu Smith, about the same time, invented an apparatus whereby a sub-base flue system was introduced;" that system had been in public use for fifty years or more previous thereto.

Fourth. Neither is it true that "some of the manufacturers, seeing the value of the combination, entered into an association for the protection of the patents which they purchased from Spear," * * * for the simple reason that the association was formed November 18, 1874, while the Spear patents were purchased by it two years later, viz., November 16, 1876.

Fifth. It is, however, true that several of the manufacturers, seeing the value of the inventions and improvements belonging exclusively to us, and which were embraced to the Argand base burner, brought out in 1873, soon after constructed new patterns in imitation of the same, and in November, 1874, formed a combination for the primary purpose of defeating our application for a patent for these inventions and improvements, in which, after squandering some \$50,000, they were utterly defeated. It is this same powerful combination that is now seeking to deprive us of our rights by virtue of concentrated capital and influence.

Sixth. It is also true that there are many "persons who do not recognize the claims of the patentees as the original inventors of the apparatus," and for that reason, some days since, and prior to the commencement of the suit against us, we instituted legal proceedings under four foundation patents, issued in 1865, 1866, 1867 and 1876 respectively, against a stove manufactured by one of this league, and known as the "Grown Jewel."

The decision in this suit will determine the liability to us of some 300 manufacturers, who are openly and defiantly infringing our patents.

The pith of the whole matter, and the secret of the formation of the league, and the instituting of the proceedings against us, lie in the wonderful success of the Argand base burner, whose advent upon the market rendered valueless every other base burning stove. The manufacturers felt compelled to use our inventions and improvements, and they do not want to pay anything for the right.

PERRY & CO.

ALBANY, Jan. 19, 1877.

The Reading Coal and Iron Company.

The Daily Bulletin of this city publishes the following: On the 30th of November, 1869, the first year of the present management, the company stood as follows:

Stock and bonded liabilities	\$36,842,992
No coal and iron company in existence.	
Dividend fund of 1869	2,276,919
No floating debt	
Coal transported over main line and laterals	4,101,512
Of which went to Port Richmond for shipment	2,362,973

On the 30th of November, 1876, the balance sheets of the two companies give the following result:

Stock and bonded liabilities of the railroad company	\$105,461,585
Stock and bonded liabilities of the coal and iron company	63,466,007
The result of the business of the last fiscal year are:	

Loss of the railroad company	\$1,361,947
Loss of the coal and iron company	653,359
The floating debt of both companies will stand on April 1st, next, at	8,273,359
Coal transported over main line and laterals	4,139,194
Of which went to Port Richmond for shipment	1,770,523

On \$48,718,008 due by the coal and iron company to the railroad company no interest is charged to the coal and iron company, and the report tells us none need be paid upon it; but it is evident that the railroad company, which lent its own credit to raise that money, has to earn the interest on it as well as the interest on \$15,728,041-68 of the liabilities of the coal and iron company held by the public and guaranteed by the railroad company if the coal and iron company cannot earn it.

The above formidable figures give us the whole story in a nutshell.

Well may the managers exclaim when alluding to the coal lands, no such estate has ever been created. We entirely agree with them.

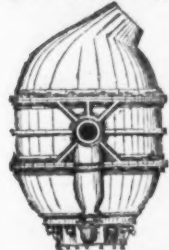
It is but little over five years since the purchase of coal and iron lands began. The coal lands, we are told, contain over one-third of the whole amount of anthracite known, and they did not produce last year one-sixth of the anthracite sent to the market. We are also told that a very small proportion of the entire estate of the coal and iron company is as yet improved. That proportion, however, is the most available and least expensive to improve, and yet after spending on their own coal lands in colliery improvements, \$4,153,396; in colliery equipments, \$906,617; in dead work at collieries, \$453,538, and charging it to capital account, fixing arbitrarily for nearly four years a price for coal far above its market value, through a combination with the other companies, accumulating in their own hands all the profits of the landlord, miner, transporter and merchant, not one cent has been made by the coal and iron company since its existence, and the railroad company went considerably short of earning its interest last year. Surely there is no other property like it.

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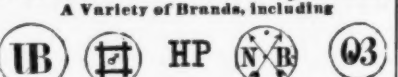
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FOOTE & McNULTY, Engineers and Contractors

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mence operations without delay.**

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New Patents.

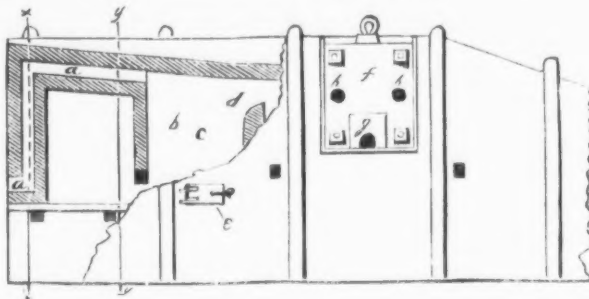
We take from the records of the Patent Office
at Washington the following specifications of
certain patents, lately issued, which will be
found interesting:

IMPROVEMENT IN CONSTRUCTION AND PROTEC- TION OF PUDDLING FURNACES.

Specification forming part of Letters Patent
No. 181,975, dated September 5, 1876, issued to
James Pedley, of Pittsburgh, Pa.

Fig. 1 is a side elevation, partly sectional.
Fig. 2 is a section of floor.

This invention has relation to puddling fur-
naces, and consists, first, in dividing the fire
chamber from the combustion chamber by
means of a hanging bridge, and in providing
air chambers, which extend upwardly and back-
wardly through the furnace roof and open into
the combustion chamber immediately above
the bridge; secondly, in the combination, with
a flanged door casting, of a detachable fire-clay
lining, which is bolted to the door casting,
and provided with nipples, which separate the
adjacent surfaces of the two—all as herein-
after described and claimed.



IMPROVEMENT IN CONSTRUCTION OF PUDDLING FURNACES.—Fig. 1.

In the end walls of the furnace are a number
of flues *a*, which rise to the roof, and then run
along the line of the roof longitudinally till
they deliver inside the hanging bridge *b*. This
hanging bridge extends the width of the fire
space and forms a diaphragm, extending nearly
down to the grate bars. Its purpose is to con-
centrate the gas and smoke, and give it an
outlet only through the gas chamber *c* in front
of the bridge *d*, thus preventing the mingling
of hot air with it till it reaches the proper
place, namely, just as it is about to pass over
the bridge *d*. That portion of the grate bars
extending under the gas chamber should be
covered, since the access of air through the
bars at that point is liable to interfere with the
working, so that practically the fuel is burned
only in the combustion chamber. Air enters
the flues *a*, and passing along the heated walls
and roof becomes hot enough to combine with
the heated gas in chamber *c*, and being di-
rected downward, produces chemical combi-
nation and intense heat, which is very effective
for all purposes.

As in the process of puddling, it is a mat-
ter of great importance to have some means

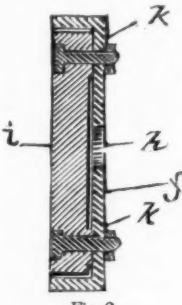


Fig. 2.

of suddenly cooling and then suddenly heat-
ing the metal, dampers are used generally,
but are not fully effective in point of time. A
door or adjustable regulator *e* is provided to
the gas chamber *c*. When the operator wishes
to cool his metal suddenly, he has only to
open the regulator *e*, which, by the draft, in-
stantly sends in large volumes of cold air,
instantly reducing the heat without interfering
with the draft. Then, when he wishes to heat
again, everything is ready, the hot air entering,
and the fuel burning briskly, and the draft on,
and all he has to do is to close the regulator *e*,
and the white heat is produced at once.
These effects may be modified by opening the
regulator *e* to a greater or less extent.

The intense heat produced in these furnaces
makes a fire-clay door a necessity. This is
usually made of a cast iron casing, the inside
of which is built up of fire bricks. But the
heat melts away the bricks or warps them so
that they fall out and expose the iron, which in
turn falls a prey to the heat. Hence, doors
are a considerable expense, as they last but a
short time. The door is constructed as fol-
lows: Take the usual casting *f* and rabbet-
bit *g*, but in the casting bolt holes at the
four corners, and one or more cold air ports
h, in the face of the casting. Then take a
solid block of fire-clay *i* of the shape shown,
which will nearly, but not quite, fill the hol-
low portion of the casting *f*, leaving an air
space on the edges. By means of the teats *k*
on the block *i* (or these projections may be on
the casting, or the same effect produced by
washers), keep the block from touching the
casting except at the bolt holes. Then the
bolts are passed through and nuts turned down
to tighten the whole. The bolt holes are coun-
tersunk on the inner face of the block. Thus
constructed air surrounds the block, and the
draft of the furnace keeps the air space con-
stantly filled with cold air, thus keeping the
casting comparatively cool. The casting will
last a long time thus, and the fire clay block
lining being in one piece does not crumble
away and melt so rapidly as when made of a
number of bricks fitted in.

Claim.—1. In a puddling furnace having the
combustion chamber *c*, terminated by the

bridge *d*, and divided from the fire chamber
by means of the hanging bridge *b*, the combi-
nation with said combustion chamber of the
air flues *a*, extending upward and backward
through the roof of the furnace, and opening
into the combustion chamber immediately
above the bridge *b*.

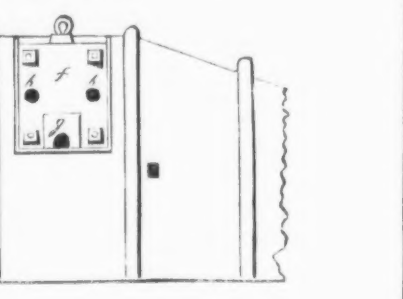
2. The combination, with the flanged door
casting *f*, of the detachable fire-clay lining *i*
bolted thereto, but separated from contact
therewith by a space around its edges.

3. The combination, with the door casting
f, of the detachable fire-clay lining *i*, having
the nipples *k* to separate the adjacent surfaces.

IMPROVEMENT IN METALLURGIC FURNACES.

Specification forming part of Letters Patent
No. 179,072, dated June 20, 1876, issued to
William Silvester and Henry Kirk, of Pitts-
burgh, Pa.

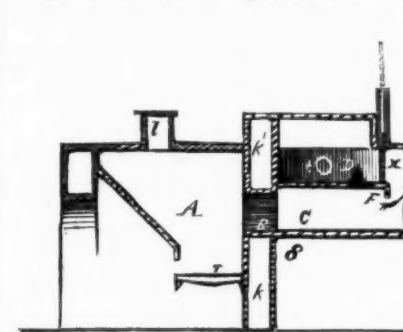
This invention relates to an improvement in
metallurgic furnaces, and consists in the com-
bination of a combustion chamber, air cham-
ber, fire chamber, air heating flue, and bridge
walls, arranged and operating with relation to
each other substantially in the manner herein-
after described.



IMPROVEMENT IN CONSTRUCTION OF PUDDLING FURNACES.—Fig. 1.

The accompanying drawing is a side eleva-
tion of the improvement in furnaces.

Referring to the drawing, A represents the
fire chamber of the furnace, provided with a
supply hopper, *l*, furnished with a valve with a
lever, through which the fuel is fed to the fire
chamber. B is a flue leading from the fire
chamber, through which the products of combus-
tion are conveyed into the gas chamber C. D is an
air chamber, placed over the gas chamber, which
communicates with a system of hot air flues,
through the openings *t*, hereafter described. E is
the working chamber. Air flues communicate with
the chamber *k*, which communicates with the air
duct *s* through the opening *8*, and this latter com-
municates with side flues in the walls of the fur-
nace that lead to the chamber *k* and the hot air
chamber D, communicating with the latter by means
of the openings *t*. F and G are bridge walls.
The hot air chamber D is provided with an



IMPROVEMENT IN METALLURGIC FURNACES.

adjustable gate *z*, by which the opening lead-
ing to the working chamber for the passage of
the hot air can be increased or diminished.

The air chamber being situated directly
above the one in which the hot and partially
consumed furnace gases are circulating, has its
temperature and that of the contained air
considerably increased thereby. As a conse-
quence, the air passes from beneath the
regulating gate *z*, and mixes with the fur-
nace gases with much more efficiency and
intensity.

The grate *r*, the stack *m* and the charging
door are all of ordinary construction.

The operation of the invention is as follows:
The exterior air enters the flues, is conveyed
into the chamber *k*, and from thence passes
through the opening *8* into the duct *s*. From
here it is deflected by the deflector into the
side flues through openings, and by these flues
it is conveyed to the chamber *k* and hot air
chamber D. The air as it passes in proximity
to the fire is increased in temperature, and in
its passage through the duct *s* and flues
absorbs heat from the walls of the furnace,
and when it reaches the place where it enters
the chamber D, its temperature is quite high,
sufficiently so to support the combustion of
the gases. The hot air passes from the cham-
ber D, induced by the draft of the furnace, and
comes in contact with the products of combus-
tion, which passes from the gas chamber C un-
der the hanging bridge wall F, in the direction
of the arrow, and at the point of contact the
intense heat of the air produces a perfect com-
bustion of the gases and other unconsumed re-
sults from the fire chamber, and a clear white
flame passes over the bridge wall G into the
working chamber, possessing an intense reduc-
ing power.

Claim.—1. In a metallurgic furnace, the com-
bination of the induct flues, the chamber *k*, the
duct *s*, the return side flues and air chamber D,
with the fire chamber and working cham-
ber.

2. In a metallurgic furnace, the combination
of the fire chamber A, flue B, gas chamber C,
bridge walls F and G and hot air chamber D,
with the working chamber.

3. The combination of the fire chamber A,
flue B, gas chamber C, with the air cham-
ber D.

IMPROVEMENT IN BATHS FOR TEMPERING AR- TICLES OF IRON AND STEEL.

Specification forming part of Letters Patent
No. 183,804, dated Oct. 31, 1876, issued to Henri
Herrenscheidt, of Melbourne, Victoria.

The bath is made by mixing together one
hundred parts of muriatic acid, twenty-four
parts of nitric acid, and fourteen parts of sul-
phate of zinc, and soaking therein for twenty-
four hours some pieces of cast iron, white
metal preferred. The undecomposed portion
of the cast iron is then removed, and the mix-
ture diluted with one thousand parts of cold
water, when it is ready for use. All the parts
are by weight.

In using the bath it is to be treated in the
same way as if it were water in which the
heated steel is to be tempered. If, however,
the steel is not compact, it must first be
welded. When the bath begins to boil from
repeated use, it must be allowed to cool, as it
should not be used above the boiling point.
It may be kept in an open vessel, as it does not
lose its efficacy by exposure to the atmosphere.

Steel of every quality may be refined and im-
proved by this bath; but its effect is more
obvious in inferior kinds, and that not only on
the surface, but throughout the whole body of
the metal. It is particularly applicable to
tools; but large masses of metal may be re-
fined and improved by it, if immersed for a
sufficient time.

Claim.—The bath for tempering iron and
steel articles, which consists of muriatic and
nitric acids, sulphate of zinc, iron and water,
prepared substantially in the manner and pro-
portions therein specified.

We take the following abstract of new pat-
ents, recently issued, from the official record:

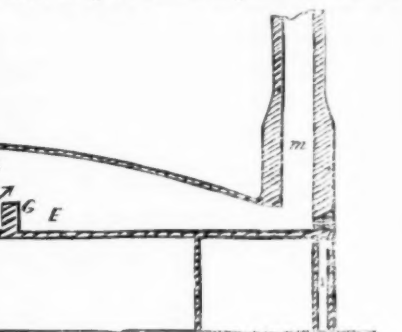
MACHINE FOR FORMING CAST INGOTS.

To T. Whitehouse, Boston, Mass.—Dec. 12.—

The material features of the invention are, first,
impacting round and comparatively thickening
edges to the blank in the process of flattening
the ingot; second, the mandrel with a rounded
front end for opening out the blank, the straight
section of uniform diameter and the terminal
section slightly tapering toward the rear; third,
so locating the mandrel that its cylindrical por-
tion shall extend both to the front and to the
rear of the bite of the rolls; and, fourth, the
guide equal in breadth to the breadth of the
blank, but of less breadth than the roller
groove.

1. In the manufacture of tubing from hollow
cast ingots, such as herein described and shown,
the particular construction of mandrels for
opening out, and over which to draw, said in-
gots, and the location of it in relation to the
bite of the rolls.

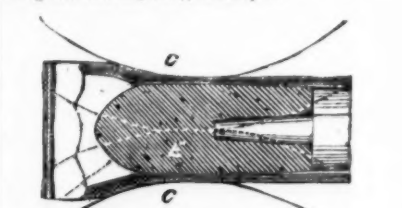
2. The combination of the grooved rolls C,
mandrel or bulb head E, and guideway J, the
latter being constructed to guide and hold the



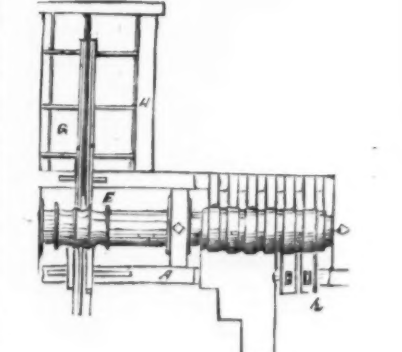
IMPROVEMENT IN METALLURGIC FURNACES.

metal blank as it is opened on the mandrel E,
and being arranged to be slid forward and
back as the rolls C, all substantially as de-
scribed.

3. The guideway J for rolls C and its guide-
box *g*, secured by screw bolt to the slotted
beam, in combination with the hinged outer
leg or support *q*, all arranged together for oper-
ating and setting the guideway J.



IMPROVEMENT IN METALLURGIC FURNACES.



4. In the manufacture of metal tubes from
hollow ingots, thickening and rounding both
edges of the flattened and elongated blank
by passing it between rolls having shaping
grooves.

5. A guide-box *g*, for shaping roll grooves *e*
and *f*, which has sides *h*, constructed to fit the
periphery of the rolls to receive between them
the metal blank to be shaped, in combination
with either groove *e* or *f*, having a width greater
than the space between the box sides *h*.

New Safety Lamp.—M. J. Coquillon pro-
poses to utilize the property possessed by pal-
ladium of remaining red-hot in a mixture of
gas and air at the expense of the compound
in the construction of miners' safety lamps.
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plosion without the palladium giving timely
warning.

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 For each additional constituent of usual occurrence..... 6 00
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 For each additional constituent..... 2 00
 For the per cent. of Water, Volatile Combustible Matter, Fixed Carbon, and Ash in Coal..... 12 50
 For determining the constituents of a Clay, Slag, Coke, or of an Ash of Coal the charges will correspond with those for the constituents of an ore.
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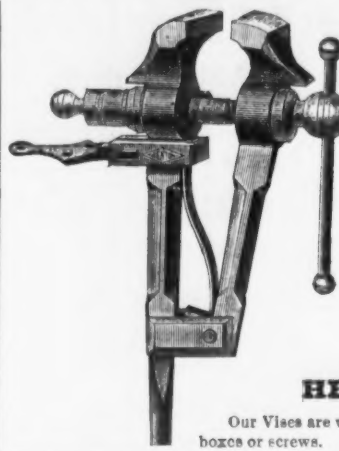
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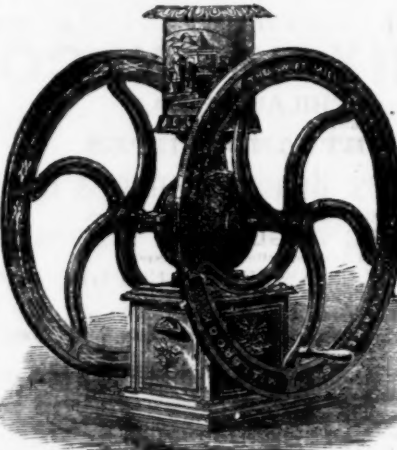
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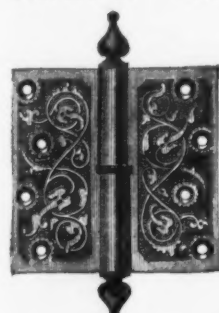
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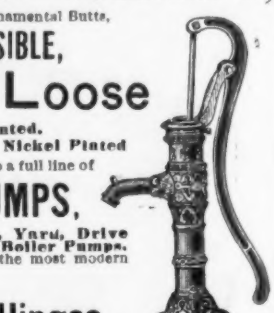
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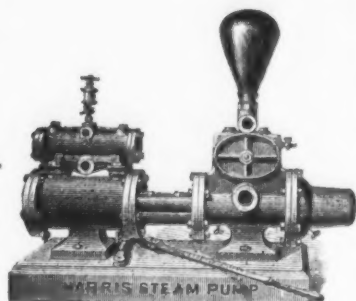
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Drilling Machines.

The following paper was read by Professor J. E. Sweet before the Mechanical Engineering Association of Cornell University:

Even in the construction of what appears so simple a thing as the drilling machine, there has been a deal of thought expended upon it already, and likely to be much more. A large per cent. of this additional thought will be in making alterations and the remainder in improvements. The lever drill, or, more properly, the lever drilling machine, is only used for small work and now almost wholly confined to manufactories in which they have a large number of small holes to drill. The general form is an upright standard, either supported upon a base plate resting upon the floor or upon a low stand, sometimes made in the form of a basin to catch the chips and oil. The post supports the drill spindle in a vertical position, a horizontal shaft and driving pulley, similar to our post drilling machine, and the two shafts are geared together with a miter gear, giving the spindle a more rapid motion with the same speed of belt than that on the post drill. In all the lever drills with which I am familiar the work is fed up to the drill instead of the drill being fed down to the work; this, for all small work, answers every purpose, though the machine for jobbing purposes would be far more serviceable if the drill was fed to the work. The advantages of the lever drill for small work are small first cost, quick action and the fact that the workmen can feel the working of the drill, and nearly one-half more work can be done than is usually done by the screw power machine. I have known a boy 15 or 16 years old drill 80 knife bars $\frac{1}{4}$ inch thick, each having about 40 holes $\frac{3}{16}$ ths of an inch in diameter, in one day. It would be drilling a $\frac{3}{16}$ th hole equal to about 66 feet deep; and over 5 holes a minute, $\frac{1}{4}$ inch deep, all day long. I know of no other machine that could approach it. To make the machine so the spindle will have 3 or 4 inches vertical motion and the table adjustable, will not detract from the present advantages of the machine, but will render it available for all kinds of work within its range.

Post drilling machines, such as the one in our shop, are made of various sizes, and ours is one of the smallest I have ever seen. Wm. B. Bement & Son, of Philadelphia, build them with a column as large as twelve inches in diameter. As a general thing, the machines built by Eastern makers have a close resemblance to each other, while each of the leading Philadelphia firms build machines characteristically different. All except Sellers, I believe, use the round post, around which the table can be swung, to allow for adjustment, or turned out of the way altogether, so that work can be rested upon the base plate. In the English practice, the table has an in and out, and a transverse slide, as well as the vertical motion, all worked by screws; but this is more costly and less satisfactory than the American practice. In the Sellers machine, the in and out slide is hinged to the vertical slide, so the table may be swung out of the way. The requirements are a table which can be raised and lowered at will; it is convenient to have it adjustable by screw motion rather than by a ratchet, for with a heavy piece, one end resting on blocking, the screw motion is better for leveling up than the ratchet device; a worm gear fills the bill. While it is better to have the table swing than adjust by positive movements, it is an advantage if the swinging table is arranged so as to rise and fall without being free to turn on the post. One advantage to be derived is that when a center is fitted in the center of a table, as in ours, though it is one great convenience not commonly applied; then, when the center is once set to coincide with the point of the drill, the table can be raised and lowered, still keeping the centers in line. There are two methods employed for the traveling spindle, one with a sliding head, as ours, which is certainly a fair sample, if not one of the best of the Eastern make; when such a sliding head is used, it should be perfectly counterbalanced, so the weight will never need any adjustment or ever be in the way. It is a good plan to have a chain which will not break every day. The other plan is where the spindle travels through the head and has a counter-weight attached to its upper end. This plan has one great advantage, that is, there is no loss motion. When the point of the drill strikes the work it is ready to begin to drill; whereas in those machines on the plan of ours, there are three or four places for lost motion which must be taken up before the pressure can be put on. This, however, is not of so much importance as that arising from the lost motion when the drill begins to come through the work; then when the drill has almost completed its work, the lost motion allows the drill spindle to drop and the drill to catch in the unfinished hole. From this cause more drills get broken than from any other.

None of you, except those who have worked without it, can half appreciate the advantage of Mr. Moler's little device for indicating the depth of the hole. With the exception of a comparatively costly device fitted to the Pratt & Whitney machine, I have seen nothing of the kind, and this, I believe, to be the first and best. The spindle of the post drills are driven with bevel gears and right angle belts. All large machines have back gearing the same as lathes, so that a 4-lift cone pulley gives 8 speeds to the spindle.

A writer, reporting on machine tools at the Exhibition for Engineering, questions the value of quick return motions—that is, whether it is worth while to arrange the machine so that by throwing out the screw feed the drill can be quickly withdrawn rather than to withdraw it by turning the crank wheel backward. While we agree in so many things, I disagree with him in this. For all small drills the lever feed can be used without throwing the worm into gear at all, and then you have the advantage of

the lever machine—that is, you can feel the cut of the drill, and know without waiting to hear it squeak or see it break, whether it is doing its work or not. I will not linger to describe the girder drill, as you will be likely to have the chance to learn all about one before you have an opportunity to use it.

The radial drilling machine is of comparatively modern invention and has been already twisted into a variety of shapes. It consists, as generally constructed, of a column carrying at its top a boom, the boom having a sliding head which carries the drill spindle. The boom being free to turn around the column and the head to slide out and in, the drill can be adjusted to any point. That is, if the cylinder of an ordinary engine be secured or rested upon the bed plate of the machine, the drill can be brought in position to drill the various holes without moving the casting. These machines have been built so that the boom could be turned upon its horizontal axis, and also so the drill spindle could be turned to or from the column, thus enabling the machine to drill at any angle as well as in any position; but the policy of these additional features is very questionable. The chances that a drill will ever be used in that position are so slim that it will not pay unless the machine is built for a special purpose when known that such a thing is wanted. All radial drilling machines and all the large post drilling machines are usually fitted with an automatic feed motion, but it is often left to rust than used, except in shops where one man is kept to run the machine. There cannot then be much economy in it, for while the drill is working, the workman has nothing to do; and if he is feeding his drill, he is not likely to be fooling around.

In the ordinary practice of drilling it is customary to locate the center of the hole and make a small indentation with a center punch; then to strike a circle with the compass the size of the hole to be drilled, and to firmly fix the location in case the circle gets obliterated; four center punch marks are made on the four sides of the circle, so that in starting the drill, if it does not start truly central, as they seldom do, the four marks will indicate the direction in which it is out of its proper place. It is also customary, when starting the drill, to examine carefully to see that it is starting true, or if it draws to one side to chip out with a round nose chipping chisel on that side, so as to bring the drill back central. I do not think this the best way—at least, the best for only those who have worked that way for years. When a man has followed one practice, and has become an expert at it, then a new way must be a very superior one to make it to his interest to change; but with you who have two ways put before you, neither of which are you familiar with, then I think the plan of drilling a small hole as quick and more certain of success. If the indentation of the center punch be as large as the small drill, then the small drill cannot be started anywhere except in the right place; and if the small drill be about as large as the thickness of the point of the large drill then the large drill hole will follow the small one to a certainty, if there are no flaws or blow holes in the metal, and they are hard to fight against in any case. The use of the small drill, and then the larger one, calls for a change of speed in the machine. To overcome this objection, I have thought of making a drill chuck to fit upon the same spindle that shall have within itself a speed gear which will give the drill a speed eight or ten times faster than the speed of the spindle of the machine, then by simply changing chucks the small drill will have the proper speed when the machine is set at the proper speed for the large one. The nature of the mechanism to accomplish this is only a planetary gear, the same as the back gear of our lathe, made on a small scale. Another improvement that can be made on drilling machines is some better method of securing chucks; the present method is too slow; some modification of the bayonet fastening is the thing.

One of the most destructive things going on in our shop is the destruction of small drills, and though I do not expect you to learn how strong, or rather how weak, the drills are until you have broken some, still the observance of two things will save a great many, and you will learn just as fast. If you wish to drill a hole only one-fourth of an inch deep, set the drill in the chuck so that it projects only about 5-16ths of an inch; then if you break it there will be but a short piece gone. See that the drill is sharp; keep it oiled and feed carefully; not specially slow when it is cutting nicely; but if it does not cut clear, do not force it; when your drill is coming through the piece be careful; hold the piece back so it cannot run on to the drill.

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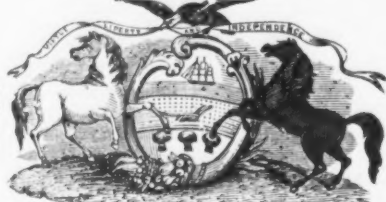
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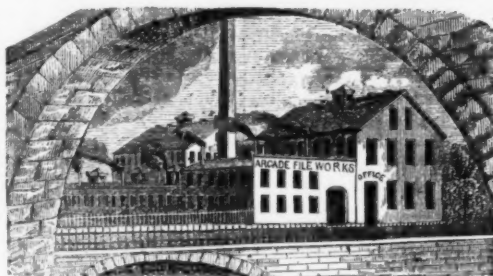


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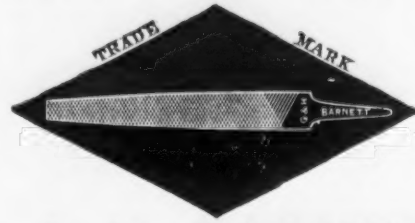
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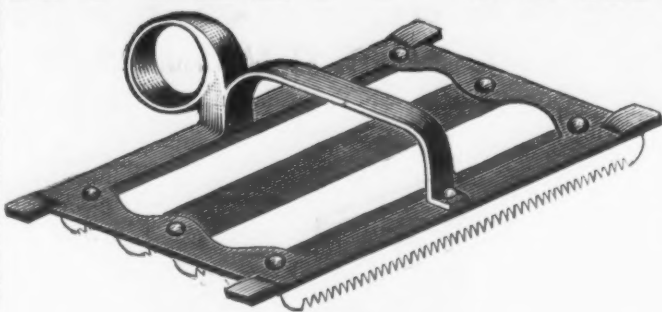
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neatest and most durable CURRY COMBS ever offered to the trade, affording an easy
grasp for the hand, without the use of the ordinary side handle, and are universally
acknowledged to be superior to all others. They are neatly put up in paper boxes of
one dozen each, and packed 24 dozen in a case. Special net prices furnished on appli-
cation.

J. CLARK WILSON & CO.,
Hardware Manufacturers' Agents
AND
Commission Merchants,

81 BEEKMAN STREET, N. Y.

Agents for

THE DAVIS LEVEL AND TOOL CO.,

Manufacturers of Plumbs and Levels, Inclinoimeters, Plumb Level and Inclinoimeter Combined, Level
Glasses, and IRON BENCH and BLOCK PLANES.



IRON BLOCK PLANE.

Iron Block Plane..... Per Dozen, \$9.00

Special Discount to the Jobbing Trade on Iron Planes.

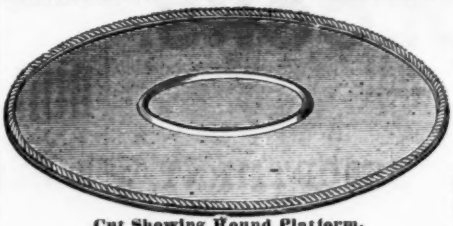
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ANSONIA CORRUGATED STOVE PLATFORM

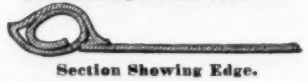
Manufactured by the

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Office, 19 & 21 Cliff Street,
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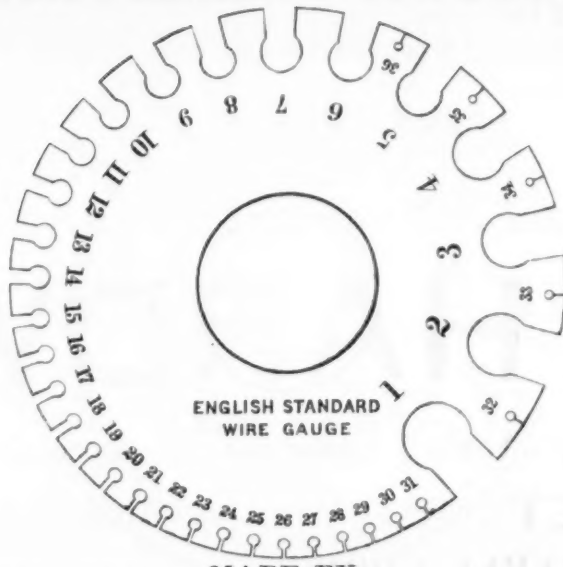
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English Standard WireGauges



ENGLISH STANDARD
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One billet train is run full time and a hoop
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It is reported that the West Middlesex Roll-
ing Mill is to resume operations about the first
of this month.

On Saturday evening, the 30th ult., the Allen-
town Rolling Mill Co.'s machine shops sus-
pended operations indefinitely. The cause was
a lack of orders.

It is reported that the Glendon Iron Company
are about to blow in an additional stack.

After a suspension of four weeks, Charming
Forge has again started up, with the expecta-
tion of running strong for some time to come.

The Keystone Hardware Manufacturing Com-
pany, Reading, are running full to fill in-
creased orders for February and March.

About 700 men find employment for eight
hours per day in the shops of the Delaware,
Lackawanna and Western Railroad Company,
at Scranton.

Henry Pott & Bro., Lebanon, recently shipped
a 15 horse-power vertical tubular boiler to par-
ties in Philadelphia. They are also construct-
ing a 20 horse-power locomotive boiler, which
will be finished this week, for parties in Frank-
ford, Philadelphia. They have received a con-
tract from Philadelphia for 5 vertical boilers.

The locomotive works, at Connellsville, are
now running full time, and have a large number
of unfilled orders.

Messrs. Sheeler, Buckwalter & Co., prop-
rietors of the large newly erected stove foundry
at Royer's Ford, have ordered one of Mr. Wei-
mer's high speed blowing engines, for blowing
their cupola. The engine is to be completed
by March 1st, and is warranted to perform its
duty. The blowing engine for the Messrs.
McLert's was shipped last week. The engine for
Messrs. Sheeler, Buckwalter & Co. will be the
seventh engine built of this class at the Welmer
Machine Works since the first Centennial en-
gine was designed.

The large rolling mill of the P. & R. Coal and
Iron Company, in North Reading, after being
in operation three weeks, has again stopped
until February 5th. The mill was idle seven
weeks previous to the three weeks' operation.

The Scranton Republican says: The Dickson
Manufacturing Company are busy filling
orders for locomotives, and will be able to give
work to a considerable number of mechanics
until the opening of spring, with fair prospects
for the future.

The chain factory attached to the Western
Iron Works, Sharon, is running as steadily as a
spring of water, averaging about 1700 weight of
chains per day. There are 19 fires in opera-
tion.

Coyne's patent nail picker is to be put in the
nail machines at Kimberly, Carries & Co.'s,
Sharon.

The National Locomotive Works, at Connells-
ville, have a full force on and a number of en-
gines under construction.

The Baldwin Locomotive Works, Philadel-
phia, recently delivered a new engine to the
Union Railway and Transit Company, of St.
Louis, for service on the bridge.

The Phoenixville Iron Company have received
an order for the erection of the huge structure
known as the "Canada Bridge," and in the
competition for the work America has proved
herself more than equal to Great Britain. This
order will give employment to the works until
the middle of August.

The Kurtzown Furnace was not blown in
as was reported through some papers, but
everything is ready, and it is presumed that
work will be commenced soon.

At the Crowther Iron Co.'s Furnace steam is
raised in the boilers in the usual way by the
waste under the boilers. After the accident,
noted heretofore, they undertook to raise steam
in boilers 66 feet long, by a coal fire at one end.
The effect of this experiment was the twisting
of the boilers out of position and breaking near
the center.

The foundations for the nail machines in
the Aetna Iron Co.'s Factory have been torn
away and rebuilt within the past two weeks.
On the occasion of our visit there Wednesday
the timbers upon which the machines were to
rest were being put in place. The repairs, and
the attachment, Coyne's automatic picker, to
every machine, will be done in a short time and
the factory started.—Newcastle Courier.

Some recent tests of iron manufactured by
Lowry, Eichelberger & Sons, Barre Forge,
develop the fact that in the manufacture of
horseshoe nails, stay and carriage bolts it is
equal if not superior to "Swedish" iron, an
item of news of some interest to the manu-
facturers of these classes of goods.

PITTSBURGH AND VICINITY.

Spang, Chalfant & Co. have an order for six
miles of pipe to convey crude oil from Com-
munipaw to the new refinery at Jersey City.

Wilson, Walker & Co. have orders enough
for railroad specialties to run their forge until
July.

The Pittsburgh Forge and Iron Company are
quite well off for orders.

Reese, Graff & Woods are making a product
they term Reese's fibrous steel. A specimen we
saw has a beautiful, clean, fibrous appearance.
We understand it is made from Bessemer
scrap worked in the puddling furnace very
much as scrap iron is. The limit of elasticity
in the piece we saw was 33,000 lbs., and the
tensile strength 57,000 lbs. per square inch of
original section.

The polishing and cold rolled iron mill of the
American Iron Works—the only one in this
country—is constantly going, but in some of
the other departments full time is not made
by the operatives.

W. D. Wood & Co. resumed work at their
mill on Monday, after nearly two weeks idleness
caused by the flood on the Monongahela
taking possession of their mill. This is the
fourth time in two years.

It is rumored that several sales of high grade
pig irons have been made by the furnaces
direct the past week.

The Pittsburgh and McKeesport Car Com-
pany have just completed and shipped to
Texas the "Pandora," a handsome new engine
designed for the Longview and Sabine Valley
Narrow Gauge Railway. The locomotive was
built with all the latest improvements and
finished in fine style, and is a credit to the
McKeesport builders.

Messrs. Anderson & Passavant have contract-
ed with Mr. J. Lloyd Haigh to furnish the steel
from which the wire for the New York and
Brooklyn bridge is to be made. Mr. Haigh will re-
quire 3400 tons, or 6,800,000 pounds of this steel.
A test made last week of a 10 ton shipment of
wire shows a tensile strength of 4550 pounds
with .04 stretch and an elastic limit of 2800
pounds. The equivalent tensile strength per
square inch is about 210,000 pounds. In order
to fill this Wharton contract without an inter-
ference to other orders, the above firm are
negotiating for the lease of the old Wharton
mill.

Mr. W. R. Jones, superintendent of the Ed-
gar Thomson Steel Works, at Bessemer Sta-
tion, has received an invitation from Herr
Krupp, proprietor of the Krupp Works, at
Essen, Prussia, to visit his works at his
(Krupp's) expense, and to become his guest
during the visit. This is a deserved compliment
to Mr. Jones, and is made in consideration of
his courtesy to a son of Herr Krupp who vis-
ited the works under Mr. Jones' charge last
summer. He was particularly pleased with a
saw invented by superintendent Jones for cut-
ting cold steel rails, and obtaining drawings
of the same, forwarded them to the works in
Prussia. Herr Krupp had a saw constructed in
accordance with the drawings, and was so de-
lighted with its success that he has sent a letter
to superintendent Jones complimenting him in
the highest terms, and extending the invitation
as above stated.

WEST VIRGINIA.

The Belmont Nail Works Co.'s (Wheeling)
boilers have gone to work after a holiday of
seven weeks.

The following are the newly elected directors
of some of the Wheeling iron companies: Ben-
wood Iron Works—Board of directors: L. S.
Delaplain, Alex. Laughlin, Thos. Hughes, E.
W. Paxton, G. B. Caldwell, Jas. H. Oglebay, L.
F. Stifel, A. W. Campbell, J. G. Hoffman. The
only change in the board is the election of Mr.
(Continued on page 11.)

USE THE BEST.



Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth. They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

Price lists and information furnished on application.

AMERICAN FILE CO., Pawtucket, R. I.

THE BEST IS THE CHEAPEST.

McCaffrey's Standard American Hand Cut Files and Rasps are warranted to do more work than any other files and rasps in the market.

SILVER MEDAL

TRADE MARK.

HIGHEST PREMIUM.

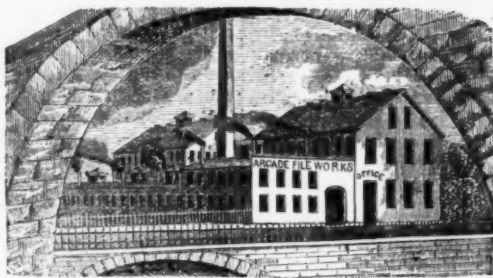


PENNSYLVANIA FILE WORKS.
McCAFFREY & BRO.,
No. 1732, 1734 & 1736 North Fourth St., Phila.

Messrs. ARNOLD & CO., 310 California St., San Francisco. Sole Agents for the Pacific Coast.

ESTABLISHED 1848.

C. T. DRAPER & CO.
Sole Agents, N. Y.
Manufacturers of SUPERIOR
HAND CUT



FILES and RASPS
Made from Best
ENGLISH CAST STEEL.
Quality guaranteed by written warranty
when required.

AUBURN FILE WORKS,
Superior Hand-Cut
FILES AND RASPS,
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.
FULLER BROS., Sole Agents,
89 Chambers and 71 Reade Streets, N. Y.

Hiscox File Manufacturing Co.,
WEST CHELMSFORD, MASS.,
MANUFACTURERS OF EVERY DESCRIPTION
—OF—
FILES and RASPS.

Alfred Field & Co.,
93 Chambers & 75 Reade Sts.,
NEW YORK CITY,
GENERAL AGENTS.

All Goods Warranted.

ELIAS G. HELLER.
PETER J. HELLER.



Horse Rasps and Files.

Made from the very best American Steel, all cut by hand, and warranted to give entire satisfaction. If requested, we will send sample lots, to be returned or held subject to our order, free of all charges, if not found as represented. All rasps not stamped as the annexed incorporated trade mark are not genuine. Sold by Hardware Dealers generally.

FILES & RASPS,
HAND-CUT. Manufactured by
JOHNSON & BRO.
No. 1 Commercial Street, Newark, N. J.

Best Cast Steel.

Established 1868.



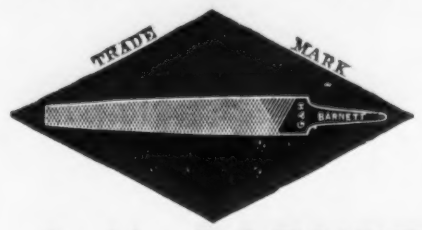
Established 1835. **TRADE MARK ON**
New Pattern
Horse Rasps,
John Rothery's
HAND-CUT FILES and RASPS,
Made from English Cast Steel.
JOHN & WILLIAM ROTHERY,
Matteawan, N. Y.



Putnam's Government Standard FORGED
Hammer Pointed HORSE SHOE NAILS,
READY FOR DRIVING.
Manufactured from the best of NORWAY Iron and warranted to give entire satisfaction.
S. S. PUTNAM & CO.,
NEPONSET, MASS.

Black Diamond File Works.

Send for Illustrated Price List.



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G. & H. BARNETT,

39, 41 & 43 Richmond St., Philadelphia.

St. Louis, Mo., SEMPLE & BIRGE MFG. CO., Agents.

THOS. TAYLOR, 43 Chambers St., N. Y., Agent for N. Y. and N. E. States.

THOS. JOWITT & SONS, SHEFFIELD,

Manufacturers of every description of

FILES.

Forged, Ground and Cut by Hand and Tempered by an Improved Process.



ROLLERS, TILTERS & FORGERS.

Manufacturers of
CAST, SHEAR & BLISTER STEEL



Importers of
SWEDISH and RUSSIAN IRONS.

For various purposes. Granted according to Act of Parliament, and Registered in Germany and the United States.

AGENTS:
Messrs. Russell & Erwin Mfg. Co., New York and Philadelphia.
Messrs. Huntington, Hopkins & Co., San Francisco and Sacramento.
Messrs. Quackenbush, Townsend & Co., New York.
Messrs. Frothingham & Workman, Montreal.

CHARLES B. PAUL,
Manufacturer of
FILES.
Warranted
CAST STEEL.

187 Tenth Street, Williamsburg, New York.

All descriptions of Files made to order. Price List mailed on application.

Established 1863

AUSABLE HORSE NAILS
POLISHED OR BLUED.
HAMMERED AND FINISHED



The Ausable Nails
Are Hammered Hot,
And the Finishing and Pointing are Done Cold,

Thus Imitating the Process of Making Nails by Hand.

Quality is **Fully Guaranteed.**

For Sale by all Leading Iron and Hardware Houses.

ABRAHAM BUSSING, Secretary,
35 Chambers St., New York.

NORTHWESTERN HORSE NAIL CO.

ESTABLISHED IN 1862.

HAMMERED AND FINISHED HORSE NAILS.

We offer our Finished Nail to the trade with the confidence that it has no equal in the market. It is the genuine "Northwestern" Nail, Finished, and we give it our unqualified guaranty.

Office and Factory, 56 to 68 Van Buren st., Chicago.

A. W. KINGSLAND, Secretary.

GLOBE NAIL COMPANY,

MANUFACTURERS OF

Pointed Polished & Finished Horse Shoe Nails.

Recommended by over 20,000 Horse Shoers.

All nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by

GLOBE NAIL CO., Boston, Mass.

Hoisting Machinery
Manufactured by
Crane Bros. Mfg. Co.,
CHICAGO.
COOKE & BEGG, Agents, 16 Cortlandt
Street, New York.

Our New Illustrated
Catalogue and Price List of
SCALES
AND
SPRING BALANCES
is now Ready and will be sent to the
trade, on application to
John Chatillon & Sons,
91 & 93 CHURCH ST.,
NEW YORK.

PRIZE MEDALLISTS:

London, 1863; Oporto, 1865; Dublin, 1865; Paris,
1867; Moscow, 1873; Vienna, 1873, and **Highest
Award and Medal at Centennial Exhibi-
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CLARK & CO.,

Original Inventors and Patentees

Noiseless Self-Coiling Revolving
STEEL SHUTTERS,
FIRE AND BURGLAR PROOF.

Also Improved

Rolling Wood Shutters

Of various kinds. Clark's Shutters are the **Best
and Cheapest** in the world. Are fitted to new
Tribune Building, Lenox Library, Delaware and Hud-
son Canal Co.'s Building, Transatlantic Steamship
Co.'s new Dock, American News Office, &c., Posey
County Court House, Mt. Vernon, Holt County
Court, Oregon, Mo. Also to buildings in Boston,
Cincinnati, Detroit, Jacksonville, Wis., Baltimore,
Canada, &c. Have been for years in daily use in
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dorsed by the **Leading Architects of the World.**

Office and Manufactory,

162 & 164 West 27th Street, N. Y.



ESTABLISHED 1858.

TRADE MARK, PATENTED.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, OR WOOD,

For Sale by the Trade and

PRINCE'S METALLIC PAINT CO.,

Manufacturers,

225 Pearl Street, New York.

Caution.—As certain parties are offering for sale a

SUPERIOR PAINT, under an imitation name,

purchasers will please see that our TRADE-MARK

is on every package. None other genuine.

C. C. Harlow & Co.,

BRIDGEWATER, MASS.,

Manufacturers of

DAMAN

Standard Hollow Augers,

Universally acknowledged superior to any other
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Spoke & Dowel Trimmers

The very best as well as cheapest.

**Metallic Combination
Plow Plane,**

Made of solid cast steel and of gun metal. Of an
entirely new design. Can be used as Groover,
Dado and Rabbet Plane, in any direction of the
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Common Sense Door Spring.

The most durable and cheapest Door Spring
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LEAD PIPE CUTTERS.

To cut lead pipe in any position and without
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Please send for circulars and prices.

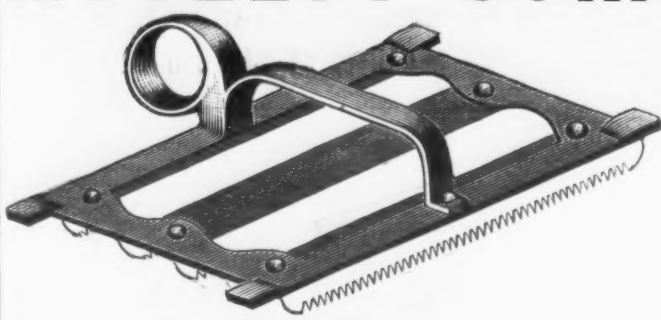
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Agents wanted in every Sugar
District to canvass for the sale
of

Post's Patent Metallic Eureka Sap
Spout and bucket Hanger. Samples,
Circulars and Terms sent postpaid
on receipt of 25 cents. Address

C. C. POST, Manufacturer & Patentee, Burlington, Vt.

HOTCHKISS' PATENT NOVELTY COMBS.



THIS CUT ILLUSTRATES THE GRASPING OF THE COMB.



Manufactured by
HOTCHKISS' SONS,
Bridgeport, Conn.

These Combs do not infringe upon the rights of any one. They are the simplest,
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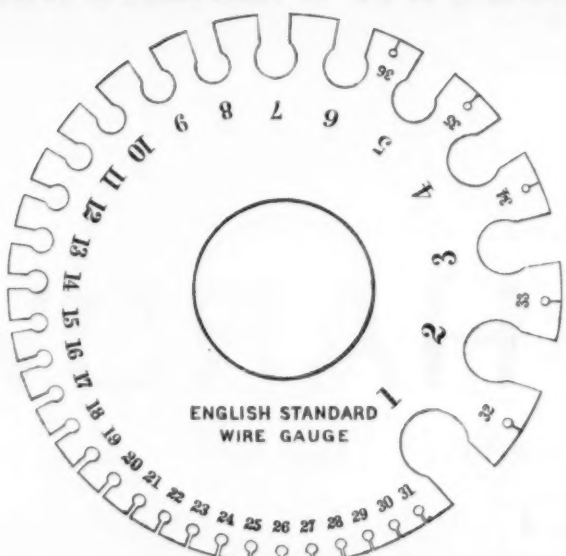


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train double time, for the production of nine
tons of hoop iron per day.

It is reported that the West Middlesex Roll-
ing Mill is to resume operations about the first
of this month.

On Saturday evening, the 20th ult., the Allen-
town Rolling Mill Co.'s machine shops sus-
pended operations indefinitely. The cause was
a lack of orders.

It is reported that the Glendon Iron Company
are about to blow in an additional stack.

After a suspension of four weeks, Charming
Forge has again started up, with the expecta-
tion of running strong for some time to come.

The Keystone Hardware Manufacturing Com-
pany, Reading, are running full to fill in-
creased orders for February and March.

About 700 men find employment for eight
hours per day in the shops of the Delaware,
Lackawanna and Western Railroad Company,
at Scranton.

Henry Pott & Bro., Lebanon, recently shipped
a 15 horse-power vertical tubular boiler to par-
ties in Philadelphia. They are also construct-
ing a 20 horse-power locomotive boiler, which
will be finished this week, for parties in Frank-
ford, Philadelphia. They have received a con-
tract from Philadelphia for 5 vertical boilers.

The locomotive works, at Connellsville, are
now running full time, and have a large number
of unfilled orders.

Messrs. Sheeler, Buckwalter & Co., proprie-
tors of the large newly erected stove foundry
at Royer's Ford, have ordered one of Mr. Wei-
mer's high speed blowing engines, for blowing
their cupola. The engine is to be completed
by March 1st, and is warranted to perform its
duty. The blowing engine for the Messrs.
Mellerts was shipped last week. The engine for
Messrs. Sheeler, Buckwalter & Co. will be the
seventh engine built of this class at the Weimer
Machine Works since the first Centennial en-
gine was designed.

The large rolling mill of the P. & R. Coal and
Iron Company, in North Reading, after being
in operation three weeks, has again stopped
until February 5th. The mill was idle seven
weeks previous to the three weeks' operation.

The Scranton Republican says: The Dickson
Manufacturing Company are busy filling
orders for locomotives, and will be able to give
work to a considerable number of mechanics
until the opening of spring, with fair prospects
for the future.

The chain factory attached to the Western
Iron Works, Sharon, is running as steadily as a
spring of water, averaging about 1700 weight of
chains per day. There are 19 fires in opera-
tion.

Coyne's patent nail picker is to be put in the
nail machines at Kimberly, Carries & Co.'s,
Sharon.

The National Locomotive Works, at Connell-
sville, have a full force on and a number of en-
gines under construction.

The Baldwin Locomotive Works, Philadel-
phia, recently delivered a new engine to the
Union Railway and Transit Company, of St.
Louis, for service on the bridge.

The Phoenixville Iron Company have received
an order for the erection of the huge structure
known as the "Canada Bridge," and in the
competition for the work America has proved
herself more than equal to Great Britain. This
order will give employment to the works until
the middle of August.

The Kurtzown Furnace was not blown in
as was reported through some papers, but
everything is ready, and it is presumed that
work will be commenced soon.

At the Crowther Iron Co.'s Furnace steam is
raised in the boilers in the usual way by the
waste under the boilers. After the accident,
noted heretofore, they undertook to raise steam
in boilers 66 feet long, by a coal fire at one end.
The effect of this experiment was the twisting
of the boilers out of position and breaking near
the center.

The foundations for the nail machines in
the Etna Iron Co.'s Factory have been torn
away and rebuilt within the past two weeks.
On the occasion of our visit there Wednesday
the timbers upon which the machines were to
rest were being put in place. The repairs, and
the attachment, Coyne's automatic picker, to
every machine, will be done in a short time and
the factory started.—*Newcastle Courant.*

Some recent tests of iron manufactured by
Lowry, Eichelberger & Sons, Barre Forge,
develop the fact that in the manufacture of
horseshoe nails, stay and carriage bolts it is
equal if not superior to "Swedish" iron, an
item of news of some interest to the manu-
facturers of these classes of goods.

PITTSBURGH AND VICINITY.

Spang, Chalfant & Co. have an order for six
miles of pipe to convey crude oil from Com-
muniaw to the new refinery at Jersey City.

Wilson, Walker & Co. have orders enough
for railroad specialties to run their forge until
July.

The Pittsburgh Forge and Iron Company are
quite well off for orders.

Reese, Graff & Woods are making a product
they term Reese's fibrous steel. A specimen we
saw has a beautiful, clean, fibrous appearance.
We understand it is made from Bessemer
scrap worked in the puddling furnace very
much as scrap iron is. The limit of elasticity
in the piece we saw was 33,000 lbs., and the
tensile strength 57,000 lbs. per square inch of
original section.

The polishing and cold rolled iron mill of the
American Iron Works—the only one in this
country—is constantly going, but in some of
the other departments full time is not made
by the operatives.

W. D. Wood & Co. resumed work at their
mill on Monday, after nearly two weeks idle-
ness caused by the flood on the Monongahela
taking possession of their mill. This is the
fourth time in two years.

It is rumored that several sales of high grade
pig irons have been made by the furnaces
direct the past week.

The Pittsburgh and McKeesport Car Com-
pany have just completed and shipped to
Texas the "Pandora," a handsome new engine
designed for the Longview and Sabine Valley
Narrow Gauge Railway. The locomotive was
built with all the latest improvements and
finished in fine style, and is a credit to the
McKeesport builders.

Messrs. Anderson & Passavant have contract-
ed with Mr. J. Lloyd Haigh to furnish the steel
from which the wire for the New York and
Brooklyn bridge is to be made. Mr. Haigh will re-
quire 3400 tons, or 6,800,000 pounds of this steel.
A test made last week of a 10 ton shipment of
wire shows a tensile strength of 4550 pounds
with .04 stretch and an elastic limit of 2800
pounds. The equivalent tensile strength per
square inch is about 210,000 pounds. In order
to fill this Wharton contract without an in-
terference to other orders, the above firm are
negotiating for the lease of the old Wharton
mill.

Mr. W. R. Jones, superintendent of the Ed-
gar Thomson Steel Works, at Bessemer Sta-
tion, has received an invitation from Herr
Krupp, proprietor of the Krupp Works, at
Essen, Prussia, to visit his works at his
(Krupp's) expense, and to become his guest
during the visit. This is a deserved compliment
to Mr. Jones, and is made in consideration of
his courtesy to a son of Herr Krupp who visit-
ed the works under Mr. Jones' charge last
summer. He was particularly pleased with a
saw invented by superintendent Jones for cut-
ting cold steel rails, and obtaining drawings
of the same, forwarded them to the works in
Prussia. Herr Krupp had a saw constructed in
accordance with the drawings, and was so de-
lighted with its success that he has sent a letter
to superintendent Jones complimenting him in
the highest terms, and extending the invitation
as above stated.

WEST VIRGINIA.

The Belmont Nail Works Co.'s (Wheeling)
boilers have gone to work after a holiday of
seven weeks.

The following are the newly elected directors
of some of the Wheeling iron companies: Ben-
wood Iron Works—Board of directors: L. S.
Delaplain, Alex. Laughlin, Thos. Hughes, E.
W. Paxton, G. B. Caldwell, Jas. H. Ogilby, L.
F. Stifel, A. W. Campbell, J. G. Hoffman. The
only change in the board is the election of Mr.
(Continued on page 11.)

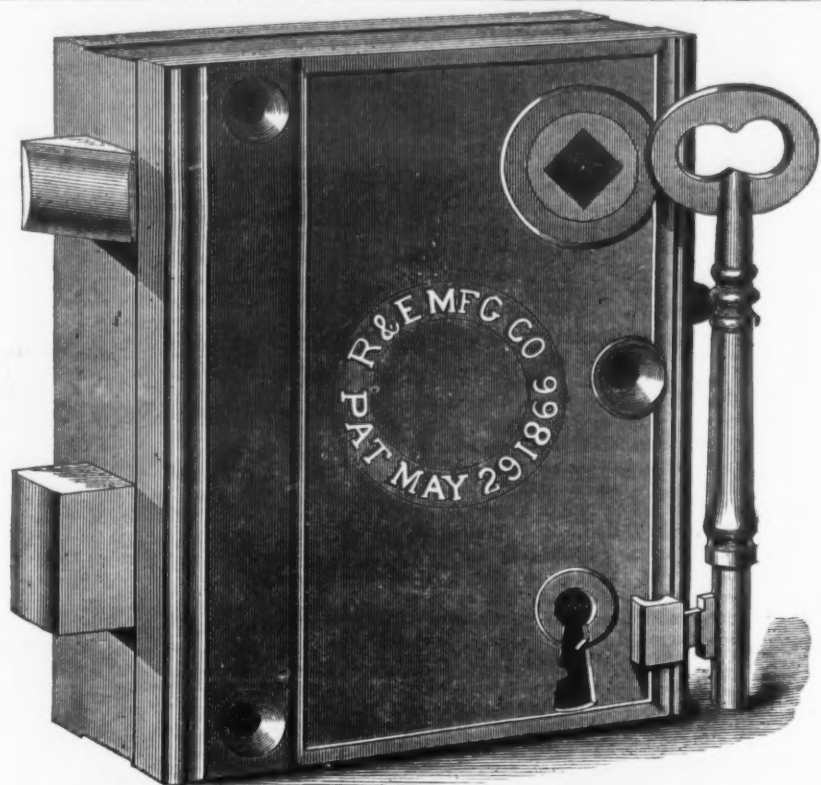
RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of **HARDWARE.**

FACTORIES, - - - NEW BRITAIN, CONNECTICUT, U. S. A.

MANUFACTURERS' AGENTS AND DEALERS IN GENERAL HARDWARE AT OUR

WAREHOUSES: NEW YORK, 45 & 47 Chambers St.; PHILADELPHIA, 425 Market St.; SOUTHERN DEPARTMENT, BALTIMORE, MD., WM. H. COLE, Agent, 17 S. Charles St.



NEW GOODS.

In consequence of the high prices established for Brass Bolt Rim Knob Locks and Latches, we have determined to place upon the market a new line of **BRASS-PLATED** goods, for which we solicit orders for immediate delivery. We shall increase our variety as occasion may require.

These goods are furnished with **BRASS-PLATED BOLTS** and **SOLID BRASS KEYS**, and in make and finish are equal to our standard goods.

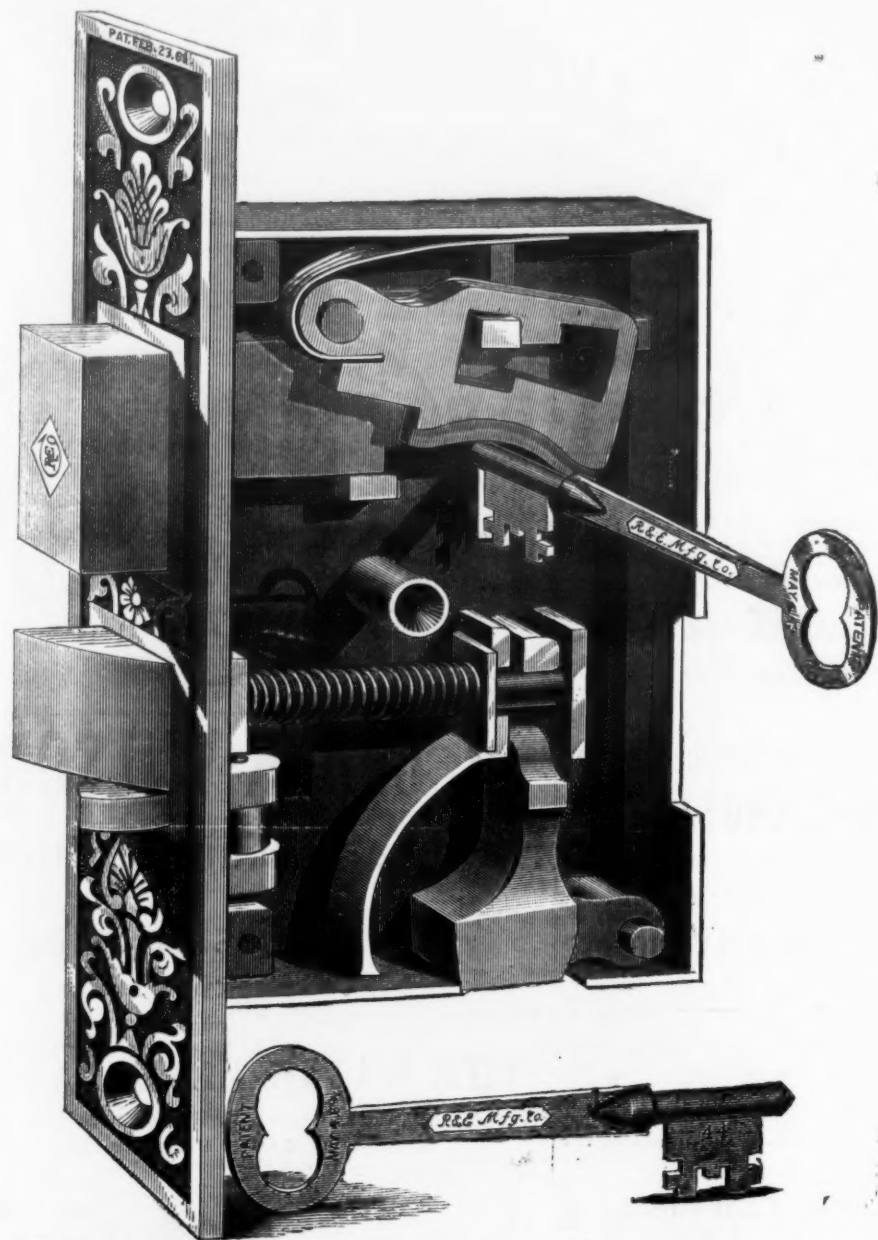
Discounts, same as on our regular goods.

HOME UPRIGHT RIM KNOB LOCKS. PULL-OUT REVERSE.

No.	Size.		Without Knobs Per Dozen.
B 861	4 inch.	Janus face, 2 Brass-plated Bolts, Solid Brass Key, without Stop.	\$5.00
B 861½	4 inch.	" " " " " with Stop.	5.25

HORIZONTAL RURAL KNOB LATCHES.

No.	Size.		Without Knobs Per Dozen.
B 557	3½ inch.	Brass-plated Latch Bolt - - - - -	\$4.00
B 552	3½ inch.	" " and Slide Bolt - - - - -	5.00



Full Size Cut of Bronze Store Door Lock and Latch, with Patent Anti-Friction Latch.

The action of the **ANTI-FRICTION LATCH** is sure and effective—doing away with all friction and jarring when closing the door. We shall also apply this latch to our Railroad Car, Front Door, and our better grades of Mortise Locks.

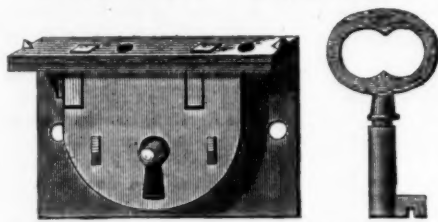
SCREWS.

We are now producing over 6000 gross per day of **Flat Head Gimlet Point Screws of Quality and Finish** which we Guarantee to be **Superior** to that of any other Screws manufactured in the **World**, and we invite a comparison under the **Severest Tests**.

Our prices will at all times be as low as those of any standard manufactures, and we solicit letters of inquiry for quotations before orders are given elsewhere.

Our Screws are all packed in our new Patent Paper Boxes bearing our labels, on which are **Large Figures** denoting the **Size and Number**.

CABINET LOCKS.



Our assortment of these goods is complete, and we can also supply a full line of "Eagle" and "Gaylord" Locks at manufacturers' prices. An **ILLUSTRATED CATALOGUE** will be issued at an early date. Parties can meanwhile order by either Eagle or Gaylord numbers.

PADLOCKS.

A FULL ASSORTMENT

WITH

Iron & Nickel-Plated Steel Keys.

Will illustrate new styles in Volume 4, which will be issued soon.

FINE BUILDERS' HARDWARE

in Real Bronze, Nickel,

Nickel & Gold, Antique,

Illuminated & Gilt.

ALSO

Door Locks & Latches.

RIM and MORTISE, of all descriptions.

We have also a full line of

GENERAL HARDWARE,

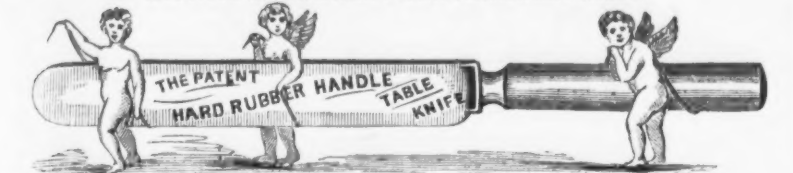
which we offer as Manufacturers' Agents, or at Manufacturers' prices. We have in press, and shall soon issue our usual **SPRING DISCOUNT SHEET** with latest quotations, and also **NEW PAGES** to Volume 3 with illustrations of **NEW AND DESIRABLE GOODS**.

Cutlery.

FRIEDMANN & LAUTERJUNG,

Manufacturers of **PEN AND POCKET CUTLERY.**
Solid Steel Scissors, Shears, Razors,
Russia Leather Straps, Hones, &c.
Sole proprietors of the renowned full concave patent
"ELECTRIC RAZORS,"
And the celebrated "ELECTRIC SHEARS." Nickel Plated
Bows.
Agents for the **BENGALL RAZORS.**
AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.
91 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

MERIDEN CUTLERY CO.
Received the HIGHEST CENTENNIAL PRIZE.



MANUFACTURE ALL KINDS OF TABLE CUTLERY.
Exclusive Makers of the "PATENT IVORY" or Celluloid Knife, the most durable WHITE HANDLE
known. The Oldest Manufacturers in America. Original Makers of the HARD RUBBER HANDLE.
Always call for "Trade Mark" MERIDEN CUTLERY CO. on the blade. Warranted and sold by all Dealers
in Cutlery, and by the MERIDEN CUTLERY CO., 49 Chambers Street, New York.

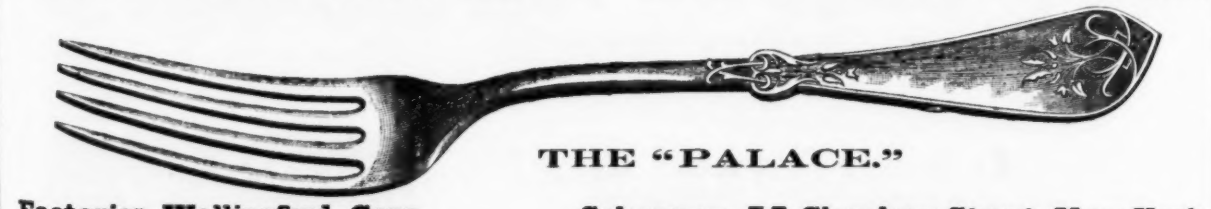


THE MILLER BROTHERS CUTLERY CO.,

Manufacturers of
PATENT FINE PEN & POCKET CUTLERY
WEST MERIDEN, CONN.
The only Knives made that are put together in such a manner that there is no strain on the
cover or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any
made, and are acknowledged by English makers as the Best American Knife. We also make
NICKEL & SILVER PLATED POCKET KNIVES
which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal
to any other knife. Orders filled from the factory, and in New York by Messrs. J. Clark Wilson
& Co., No. 81 Beekman Street (who have a full stock of all patterns always on hand), and also by
Messrs. G. B. Walbridge & Co., No. 99 Chambers Street.

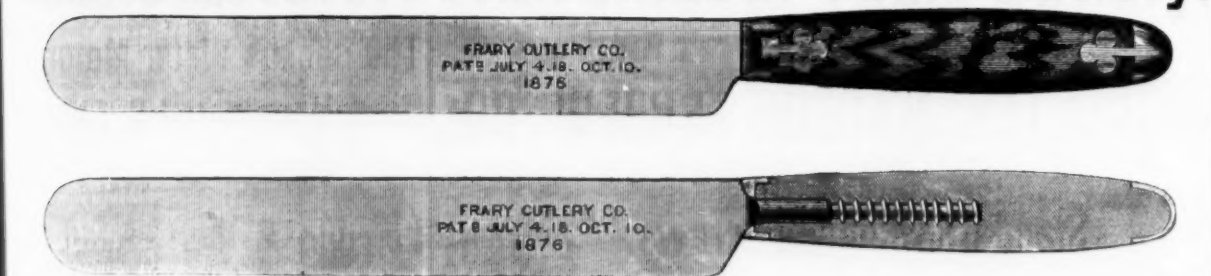
NAUGATUCK CUTLERY CO.,
Manufacturers of FINE PEN & POCKET CUTLERY.
FULLER BROS., Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

HALL, ELTON & CO.,
Electro Plated Ware, German Silver and Britannia Spoons.



Factories, Wallingford, Conn. Salesroom, 75 Chambers Street, New York.

THE FRARY CUTLERY COMPANY,
FACTORY, Bridgeport, Conn. NEW YORK OFFICE & WAREHOUSE, No. 82 Chambers St.



The above Illustrations represent their New Patent Screw Tang Lock Fast Solid Handle Knife.
There is no question but that a solid handle Knife is much more preferable than a scale tang. The great objection to their use hitherto is, that no solid wood handle
has been placed on the market with the handle properly secured—no handle put on with cement will stand the wear and tear of every day usage. The cement will expand
and contract with the action of heat and cold, and become loose, crack and come off, causing great prejudice against their use. This objection is overcome in our patent
screw tang. A wood screw is welded to the tang of the Knife or Fork, and screwed firmly and securely in the handle and locked there by the bolster, making a very strong
and handsome knife, which we warrant never to get loose, crack or come off. We manufacture a large variety of patterns, both Table, Butchers and Carvers, and
furnish the patent handle nearly as low as the scale tang, and we are prepared to furnish this line of goods, together with the scale tang and iron handle, very promptly,
and we very respectfully invite the attention of the trade.

OWEN & CAMPBELL, THE ROGERS CUTLERY CO.,

Manufacturers of
PEN AND POCKET CUTLERY.
All blades forged from the best English Cast Steel,
and warranted. Each knife made in the
most substantial and compact manner, all articles
being of the best quality. All blades stamped
Owen & Campbell, Philadelphia.
Orders filled from the Factory Rear of
420 N. Second St., PHILADELPHIA. P. O. Box 204.
HARTFORD, CONN.

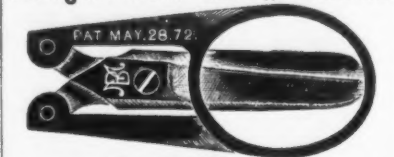
Cutlery.

NEW YORK KNIFE CO.

ESTABLISHED 1852.
MANUFACTURERS OF SUPERIOR
Table & Pocket Cutlery,
WARRANTED TO BE MADE OF THE BEST
MATERIAL.
WALKILL RIVER WORKS,
Walden, Orange Co., New York.
THOS. J. BRADLEY, President.



Young's Patent Folding Scissors.



Fac simile of the small size.
These Scissors are made of the very best steel, nickel
plated, and so constructed that they can be readily
folded and carried in the pocket without injury to the
garments. A sample pair will be sent by mail, to the
trade only, upon receipt of the retail price, namely:
For small size, either blunt or pointed.....\$1.00
Large size, pointed or half pointed.....\$1.50
New York, Feb. 1st, 1876.
MARX BROS., Proprietors,
430 Broadway.

AMERICAN PEN AND POCKET KNIVES,

MANUFACTURED BY **PEPPERELL,**
Aaron Burkinshaw, MASSACHUSETTS
My Blades are forged from the best Cast Steel, and
warranted. To me was awarded the GOLD MEDAL of
the Connecticut State Agricultural Society, also a Gold
and Diploma from the Mass. Mechanics' Ass'n Sept., 1876.

Established 1853.
AMERICAN SHEAR CO.
Manufacturers of
Pen and Pocket Cutlery,
Shears, Scissors and Pruning Shears,
HOTCHKISSVILLE, CONN.
Salesroom, 298 Broadway, New York, with
LANDERS, FRAY & CLARK.

Cutlery.

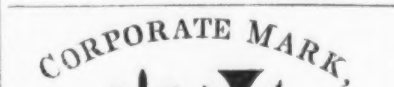
JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA
AGENT FOR
George Wostenholm & Son,
"Limited."
Washington Works, SHEFFIELD,
Celebrated I-XL Cutlery, Razors, &c
AGENT FOR
WALTER SPENCER & CO.,
Steel and File Manufacturers,
Rotherham, ENGLAND.



F. W. HARROLD,

Birmingham and Sheffield,
ENGLAND.
Importer on Commission
OF
HARDWARE, CUTLERY, GUNS, &c.
W. SANDERS, Agent,
76 Reade Street, N. Y.



Joseph Rodgers & Sons'

(LIMITED)
CELEBRATED CUTLERY,
No. 82 Chambers Street, New York.
F. & W. CLATWORTHY, Agents.
The demand for Joseph Rodgers & Sons'
productions having considerably increased, they
have, in order to meet it, greatly extended their
Manufacturing Premises and Steam power.
To distinguish Articles of Joseph Rodgers
& Sons' Manufacture, please to see that they bear
their Corporate Mark.

VAN WART, SON & CO.

Hardware Commission Merchants,
EXPORTERS AND IMPORTERS,
BIRMINGHAM, - ENGLAND
Agents,
McCOY & COMPANY,
134 & 136 Duane Street, N. Y.
George H. Gray & Danforth,
48 India Street, BOSTON.
F. W. TILTON,
17 Old Levee Street, New Orleans.

At each of these places a complete assortment of sam-
ples of Hardware and Fancy Goods will be found, in-
cluding all new descriptions. Sole Agents for
John Himmer & Son's Celebrated
Harness and other Needles.
W. Clark's Genuine Horse Clippers.
Seydel's "Ashantee" Pocket Hammock

McCOY & COMPANY,
BORAX A SPECIALTY,
134 & 136 Duane St., New York.

ICE HOUSE HINGES AND FASTENINGS

Manufactured and for sale by
A. A. IRVINE,
No. 14 Murray St., New York.
P. O. Box 3034.

H. G. DeBAUN,

179 William St., N. Y., Dealer in
Glue, Emery, Crocus,
SAND AND EMERY PAPERS,
And all kinds of Polishing Goods.

HUGH W. ADAMS,

Iron Commission Merchant.
RAILWAY, PIG AND SCRAP IRON.
56 Pine Street, N. Y.

Agent, Millerstown Iron Co.'s Foundry Pig Iron.
Grove Bros. Columbia Furnaces, Foundry and Forge
Pig Irons. Eureka Iron Co.'s (Detroit, Mich.) Lake
Superior Charcoal Pig Irons.

COBB & DREW,

Plymouth, Mass.
Manufacturers of Copper, Brass, and Iron Rivets - Com-
mon and Swedes Iron, Leathered, Carpet, Lace and Gun
Tacks - Finishing, Hanger, Trunk, Closet and Chair
Box Nails, &c. Rivets made to Order.
NEW YORK AGENCY

Grundy & Kenworthy

HARDWARE.
185 Greenwich Street.
Agent for the Philadelphia Star Carriage and Tire Belts

Shelton Company,

Manufacturers of every variety of
TACKS & SMALL NAILS.
Carriages, Machine, Floor, Stove and
Tire Bolts, Coach Screws,
Bed Screws, &c.
BIRMINGHAM, CONN.

(Continued from page 9.)
INDUSTRIAL ITEMS.

WEST VIRGINIA.
Jas. Ogilby, vice C. Ogilby, deceased.
Wheeling Hinge Co.—Board of directors: A.
W. Campbell, A. G. Robinson, C. D. Hubbard,
O. J. Crawford, J. L. Hobbs, John McLure, L.
E. Hanson, C. J. Rawling, I. H. Williams; offi-
cers: A. G. Robinson, president; L. E. Hanson,
vice-president; I. H. Williams, secretary. The
only change in the board is the election of Mr.
C. J. Rawling, vice Mr. G. B. Caldwell, re-
signed. La Belle Iron Works—Board of di-
rectors same as last year, as follows: S. H.
Woodward, Henry Wallace, Wm. Linch and
John Wright, of Wheeling; and C. B. Doty,
David Spaulding and John McClinton, of Steu-
leville.

OHIO.
Brown, Bonnell & Co., of Youngstown, made
last year some 30,000 tons of pig iron; more
than ever before.

At the foundry of W. S. Craine & Co., Cleve-
land, 22 men at present find work, but as busi-
ness is steadily increasing, it is anticipated that
the number of men employed will soon equal
45, the regular force of the shop. Mr. Craine
states that the past month has been the only
slack period the company have experienced
within three years.

Mr. A. B. Stone has been elected president of
the Cleveland Rolling Mill Company for the
coming year. H. Chisholm will act as vice-
president and general manager, while E. S.
Page will perform the duties of secretary.

Fifty workmen are employed at the Cleve-
land Foundry in the manufacture of car
wheels. The foundry is being operated to its
fullest extent, and the prospects for the future
are excellent.

The Ohio Steel Barb Fence Works will prob-
ably be run with a full complement of men
(150) after the 1st of February. There are now
50 men employed by the company.

The Bellaire Nail Works, Bellaire, have
placed their funded debt at a lower rate of in-
terest.

The Athens Messenger says that the new
Thomas Iron Works, at Gore, on the Hocking
Valley, is making 20 tons of No. 1 iron per
day.

John Sharratt and James Sheldon, bricklay-
ers, are building a patent puddling furnace of
their own invention at Brown, Bonnell & Co.'s
Works. They expect to have the furnace in op-
eration to day.

The Lawrence Mill, at Ironton, is putting in
six new boilers, which weigh about 25 tons, and
cost \$3400. They were built by Messrs. J. H.
Fisher & Co., of the same place, out of Gaylord
boiler plate.

Belfont Furnace, Ironton, blew out Tuesday,
the 16th ult. Before going to blast again a
new hearth will be put in. The company have
a large stock of pig iron on hand, and it may
be some months before the furnace starts up.

The Aetna Furnace, Ironton, is making from
60 to 65 tons of good iron every day.

The old mill at Ironton has recently turned
out some wrought iron made from Sheridan
coke metal, which is pronounced to be the very
best.

At the organization of the board of directors
of the Iron and Steel Company, Ironton, which
occurred the 15th ult., E. McMillin was chosen
president, and will forthwith take supervision
of the affairs of that institution.

MISSOURI.
Messrs. Spooner & Collins, of St. Louis,
have sent a circular to their customers and
friends announcing that they have moved from
their old office to 217 North Third street,
Room 1. Their new location is opposite the
post office.

INDIANA.
The old rolling mill at Indianapolis sus-
pended for general repairs Jan. 1. Four of the
furnaces will be wholly rebuilt and seven par-
tially.

The Capital City Rolling Mill, Indianapolis,
is in operation under a new firm.

TENNESSEE.
Messrs. Lewis Scofield, Sr. and Jr., at Chat-
ta-nooga, have in operation one of the finest mills
in the country, and are doing well, making all
kinds of merchant and bar iron.—Commercial.

Some of the iron mills at Chattanooga have
gone into the production of muck bar, and are
offering it on the market at \$31 to \$34.50 per
ton. With finished iron selling at \$1.80 to \$2,
where is the profit?

MICHIGAN.
The Wyandotte Rolling Mill Company have
served a notice of a 12 1/2 per cent. reduction of
wages of all employees working by the ton.

The total amount of iron ore and pig iron
carried over our two railways in 1876 was 1,005,-
424 gross tons, an increase of 92,825 tons, the
A. H. & O. R. R. leading the C. & N. W.
R. R. 172,382 tons, but the latter being cred-
ited with the whole of the increased aggregate
tonnage over 1875.—Marquette Mining Journal.

The charcoal kilns of the Carr River Furnace
are being filled and burnt out and filled again.
They are busy using up the stock of wood on
hand, and providing charcoal for future use.

J. P. Willard & Co., at their forge in Deperre,
recently turned out a wrought iron shaft 7 1/2
inches in diameter and 26 feet long, for the
Kirkby Carpenter Company.

A bar used for handling sheets went through
the chilled rolls in the plate mill, at Wyandotte,
Tuesday morning. The rolls were not hurt,
but the bed plate and gear wheels were broken.
It will cost about \$100 to repair the damage.

The copper works at Springwells have closed
work till more copper arrives next May.

The main building of the Illinois Manufac-
turing Brass Works, at Adrian, was burned by
an incendiary on Thursday the 25th ult.

KENTUCKY.
Kentucky not only claims the credit of hav-
ing built the first furnaces in the Hanging Rock
Iron Region (Argillite, 1822; Pactolus, 1822;
Steam, 1824)—but it was on her "bloody soil"
where the first iron furnace of the West was
constructed, one of the earliest in the country.

This was called State Furnace, situated in Bath
county, on State creek, a branch of Licking
River, built as early as 1791, and went out of
blast 1821. One and a half miles southeast of
that furnace is the Block House Ore Bank (on
the Clinton group), a deposit of from 10 to 12
feet solid thickness, yielding, by analysis, 52-55
per cent. of metallic iron.—Greenup Inde-
pendent.

Messrs. Thomas Meikle & Co., Louisville,
have increased the capacity of their works
fourfold. They are now making a full line of
wood and iron beam turning plows. Of iron
beam double shovel plows alone they expect to
turn out 15,000 during the season.

PEACE & HOGAN, VULCAN SAW WORKS.
Manufacturers of every kind of
Patent Ground
SAWS.
Circulars, Cross-Cuts, Mill,
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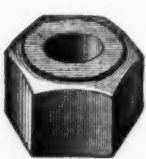
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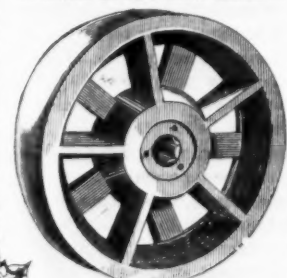


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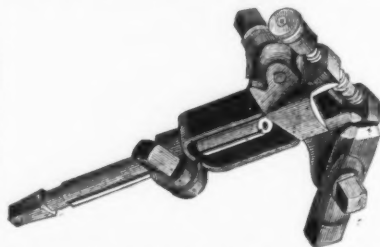
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The Commercial Outlook.

There are many indications which warrant the belief that we shall witness, during the next three months, a healthy revival in the productive and distributive industries of the country. As we have before said, we believe that the revival last fall was a natural and legitimate result of the working of causes not only favorable to recovering, but necessarily compelling a larger production and a more active commercial movement. There is a limit to the economy of consumption which the people of a country can practice for a term of years. Whatever goes into consumption is sooner or later consumed. It cannot be eaten by man it is by moth or rust. We can

wear our clothes a long time, perhaps, but they will wear out in time, and we must buy new. The real or imagined necessity for economy which prompted the people of the country to contract their expenditures so sharply when the true nature and serious character of the panic of 1873 was realized, was not without good results in putting a check upon the extravagance which characterized our style of living as a people; but the economy thus induced has been carried somewhat too far. The working classes, only partially employed, are still restricted in their purchasing capacity, but the reason they stand idle is because those who have the means of satisfying their wants are still practising a close and systematic economy. Last fall they were beginning to recover confidence in the stability of things, and to look for a favorable change. It was believed that the bottom had been reached, and the advance of prices and wages incident to a larger demand for labor and commodities gave warrant in this belief. But the conditions were unfavorable. The interruption of the political canvass would probably have been but temporary, and the people were prepared, as heretofore, to accept the result loyally, if not with entire satisfaction. When it was known that the result was so delicately balanced that a decision could not be reached for months, the popular excitement and apprehension reacted upon trade, and the country was once more plunged into the depths of depression. At a time when our political system was subjected to a new and unexpected danger which menaced it even more seriously than any of the tests to which it was subjected, the growing confidence of the people was once more shaken, and even the most enterprising stood with folded hands waiting to see what would come. Fortunately for the country, statesmanship has triumphed over partisanship, and the passage of the bill looking to an amicable and correct count of the electoral vote is hailed by the whole country with satisfaction. The issue of the election, so far as the choice of President is concerned, is of little practical importance, provided that issue is decided in accordance with justice and right. A majority of our people believe that the affairs of the nation would be safe in the hands of either of the aspirants to the presidential chair.

Both are men of broad and liberal views, and both are committed to a policy looking to economy, to civil service reform and to a return to a specie basis by the easiest and safest of practicable methods. Before the time for active business shall have fairly come, all doubts as to the correctness of the count will have been settled, and nothing in the political situation will remain to menace the peace and welfare of the country during the next four years. If, then, as we believe, the conditions are all favorable to a continuance of the improvement so fairly begun in September and October last year, 1877 should realize all reasonable expectations. That stocks of merchandise in retailers' hands are very light, and that a very general replenishment is necessary before they will be prepared to meet even an average consumptive demand, is generally admitted. Real estate is no longer held at fictitious valuations, and leases made this spring will probably be based upon the lowest rentals demanded for many years. The greenback is within 6 per cent. (a year's interest) of gold, wages are as low as they are likely to go, and prices have adjusted themselves to a gold basis. Through all the long period of uncertainty and excitement gold has steadily worked down and government bonds have manifested unusual firmness. The sensitive barometer of the financial markets has failed to record any indication of trouble in the threatening wind clouds of the political horizon, and when the excitement is all over and the result of the election declared, we shall probably make the discovery that the country has been safe all through, and that the solid good sense and unshaken loyalty of the American people counts for more than the froth of political debate or the wrath of a partisan newspaper press.

We do not claim the gift of prophetic power, and experience has taught us that, in times like these, it is well to be cautious in forecasting the future. We fail to see, however, anything in the situation or the outlook which is not favorable to revival, and unless new and now unforeseen events shall complicate the situation and again paralyze our national energies, we may hope that before another three months the whirr of busy mill wheels and the clang of heavy hammers will once more gladden the hearts of the people, and that a new life will thrill through the sluggish pulses of trade. We must not forget, however, that our progress toward solid ground must be on a bridge of thin ice for some time to come. Trade will remain peculiarly sensitive to unfavorable influences,

and nothing will so quickly and effectually check consumption as an attempt to advance prices in anticipation of a legitimate basis for such an advance. Those who think revival means a return of the conditions existing before the panic will find themselves much disappointed. Close economy in production and distribution, a more conservative business policy, and a careful application to the daily affairs of life of the knowledge to be gained from the experiences of the past four years, will be found the indispensable conditions of success in business. We have had our wild dance and the piper has been paid. Now we are ready to walk soberly and with good heed to our footsteps.

The Present Condition of the Western Iron Trade.

It is undeniable that there is a strong feeling among iron manufacturers that the worst has been felt, and that the close of 1877 will see a marked improvement in the iron trade. While some of the more enthusiastic manufacturers, both of pig and merchant iron, look for an immediate and decided change for the better, both in prices and demand, the more cautious and conservative will be satisfied, all things considered, if it comes later in the year, though many of them look for a decided improvement in the tone of the market at once.

There are a number of reasons that justify this anticipation. In discussing them we do so in reference to the Western market alone, as it is generally conceded that any improvement must begin here. There can be but little improvement in pig until there is a better state of things in the merchant iron trade, and in this trade the West has been the most demoralized. Prices have ruled lower, its iron has been put into the Eastern market at rates which some of the Eastern makers would not touch, and the West is in a better shape to inaugurate a movement that will commit the manufacturers of merchant iron to a united policy as to prices and production. For these reasons we confine our remarks to the West.

In regard to pig iron we say, first, that the West is almost bare of coke mill irons. We have gone over this subject very carefully, and have compared our figures with those of some of the best Western furnace men, and we unhesitatingly say, first, that there are 200,000 tons of iron less in the West to-day than one year ago, and second, that the stocks are still being reduced. We shall have more to say of this in a future number.

A second point regarding pig iron is that there is beginning to be a better demand for high grade pig, or pig made without cinder, or at least with not over ten per cent. For example, the Allen Furnace, which has been out for years, and which had some very good iron on hand at the close of its blast, which has been held for high figures, has sold more since January 1st than during the whole year 1876. Negotiations are pending for the sale of some fair blocks of Spearman and Rosena iron at prices which buyers laughed at three months ago, saying cinder iron answered their purpose. They are finding their mistake.

And this leads us to merchant iron. There are indications here that are most healthy. In the first place merchants and consumers are beginning to learn that if they buy \$1.80 iron they get \$1.80 iron and not \$2 iron. They have been fooling themselves into believing that they could pay \$1.80 for bars and get \$2.25 iron, and after having made a contract at a low figure, they have poked themselves under the ribs, and laughed at their own wisdom and the good bargains they have made. But merchants and consumers have no vested right in all the wisdom in the iron trade, nor have the manufacturers been endowed with all the foolishness, though it must be confessed they seem to have had their full share. Still, the manufacturers had some wisdom, and when they sold \$1.80 iron they made and furnished \$1.80 iron, and the customer had no just grounds for complaint, for it was what he bought and paid for. They are learning this, and as, for some purposes, they must have better iron than \$1.80, they are asking for it and paying for it, and it is the demand for this grade of iron that has made the better demand for high grade pig iron which we have mentioned above.

Another healthy indication for the future is the way in which stocks are held. The stocks of merchant iron in the West are to-day largely held by the manufacturers and not by the jobbers and merchants. This is especially noticeable in regard to nails. The stocks held by middlemen are not one-quarter what they were a year ago. One nail manufacturer stated in our hearing a few days since, that a year ago he had 30,000 kegs of nails in the hands of agents, while now he has not 5000 kegs.

Any manufacturer who has watched the course of his orders will be convinced from these alone that stocks are light. Orders are small, for small quantities of a size, and frequent. The spring trade will open with very light stocks. When merchants are convinced that the movement is upward there will be a rush for iron that will more than consume all the stocks the mills have. And some consumers of iron are convinced that the turn is at hand. One of these is now trying to place an order for 2000 tons for his own use this year, and is steadily refused at present prices. Manufacturers are refusing to book orders at ruling rates for anything but immediate delivery, the policy being to supply the trade from day to day.

To-day the only thing that stands in the way of a sharp advance of iron in the West is the capacity for production. It is not stocks on hand; it is not the actual production; it is this over-capacity that is in the leash ready to be let loose at the first sight of any game. If this can be controlled; if the production of the mills now running can be regulated, then iron will advance at once; and it looks as though these matters could be controlled.

The Commercial Value of a Good Name.

The idea that a man's worth was measurable by the amount of his wealth, was one of the inheritance of curses left us by our great civil war. During that period of national disturbance it was comparatively easy for a shrewd, unscrupulous, wide-awake man to acquire capital by other and much easier means than were open to any but men of exceptional abilities in the days of peace and normal prosperity. It was no uncommon thing for fortunes to be made in a day, and thousands seemed to pass from comparative poverty to affluence by a single, bold, well considered venture. Army contracts, sudden and sharp fluctuations in values, commercial speculations, operations in petroleum, gold and silver mining, railroad extension and real estate, and the enormously stimulated and indiscriminating demand for all kinds of products and commodities, placed the possibility of wealth within the reach of a very large class of men who had never before had the chance of acquiring capital by other means than the slow and laborious process of earning and saving it. The man who made money in those days, whatever the means by which he acquired it, was regarded as sharp, shrewd and enterprising; the man who did not make money was looked upon as a plodder—virtuous, it may be, but without enterprise. Success in any business covered a multitude of sins against the laws of God and man. The contractor who robbed the government of millions; the operator who organized a bogus company and filled his purse with the proceeds of worthless shares sold to credulous dupes; the business man who grew rich in illegitimate outside speculation—every one, in short, who could make a fortune and keep out of the meshes of the law, held his head high and received as his just due the homage which the world pays to success. When the war was over and the opportunities which grew out of it were no longer open to those who had profited by them, the wealth they had gained was employed in maintaining as long as possible the artificial conditions so favorable to all who held the belief that to reap where one had not sown was their proper occupation in life. Then began the era of wild and reckless speculation which culminated in the panic of 1873. That much of the easily acquired wealth of war times, based as it was upon fictitious valuations, was swept away or found permanent investment in worthless securities, affords but little consolation to those who deplore the mischief already done. The example of success is always alluring, but the lesson of failure is not so easily learned, and it will have been worth all it has cost us if the three past years of stagnation and depression have brought us to a realizing sense of the fact that there is something in life worth living for except wealth and its ostentatious display.

It is not at all to be wondered at that the effect of these causes was felt in the demoralization of the business community. Even profitable trade was too slow a means of acquiring wealth to suit a majority of those engaged in it. The successful merchant was constantly beset with temptation to venture his surplus capital in promising speculation, and even to so employ the capital upon which his commercial credit was based. To the small tradesman and manufacturer the temptation came in another form. Credit was easily obtained on the basis of a good outside showing, and few could resist the inducements offered them, and even pressed upon them, to expand their operations until their business resembled an inverted pyramid balanced on a nominal capital. To those not in business the inducements to

"strike out for themselves" were equally strong; and with everything to gain and little or nothing to lose, thousands went into business and trusted to good luck and superior enterprise to carry them through. As a consequence, the collapse of the bubble of a prosperity based largely upon an inflated currency and fictitious valuations found the business of the country in a condition peculiarly favorable to widespread disaster. There was a solid and substantial foundation under all, but it was not broad enough to sustain the overhanging superstructure. Then began what is known as the "weeding out" process, and with it a worse demoralization than had been known before. The business man who found himself unable to meet his obligations was tempted to consider whether by "failing judiciously" he could not get more capital than he had ever had. Prompted by professional assignees, and guided by shrewd, unscrupulous legal advisers, thousands of merchants, manufacturers and tradesmen went before their creditors with skillfully prepared statements, and compromised their debts on the best terms they could get. Possessed of stocks costing them from twenty to forty cents on the dollar, low prices and dull trade made but little difference to them, and when it was necessary to replenish, they had the cash with which to buy until they had once more secured a line of credits. With this example before him, and compelled to face a competition which left no chance of profit, there was every inducement to the debtor with ample means to satisfy his obligations to venture the same experiment, and of the whole number of failures during the past three years a large percentage have been of a kind calculated to benefit the debtor in a business way. To the creditor the choice of alternatives has been a hard one. Under the existing bankrupt law the debtor has had the advantage. "This or bankruptcy" was his insolent ultimatum, and the creditor knowing that bankruptcy meant nothing for him, took the 25, 30 or 40 per cent., and congratulated himself on having secured that much. There is, however, a limit even to the easy, selfish good nature of creditors. The impression is gaining ground that failures have been altogether too easy, and discharges altogether too cheap. The "weeding out" has become much too thorough, and the time has come to deal sharply with dishonesty. No compromise with anyone who cannot show good and sufficient reason for his inability to pay is now the firm resolve of most of those who give credits. If a man has been unfortunate, or has become embarrassed from any cause beyond his control, be merciful, and give him a chance to get on his feet again. If he has failed through bad management, or if there is any reason to suspect that his failure is tainted with fraud, push him to the wall. We are glad to see this spirit so generally manifested in business circles. If the creditor is careless of his own interests he is none the less bound to protect the honest debtor who pays his debts against the guerrilla competition of those who compromise them. Nothing but vigorous measures to stamp out this growing evil will save the business of the country from utter demoralization.

We do not doubt that there are many honest men throughout the country who have been sorely tempted during the past three years to sell honor for profit. They have seen rascality flourish, and have more than once wondered whether the honest man was not a fool, provided he let his honesty stand between him and gain. We have more than once heard merchants say that they considered it safer to sell to a man who had failed and compromised than to one who had not, as the former was more likely to have the money to pay his notes when they came due. If they have talked this way to their customers, it is no wonder that even honest men have paused to weigh the chances of honest success against those for profitable fraud.

That manufacturers and merchants have with almost one voice, agreed not to accept an offer of compromise in any case not calling for especial leniency, shows that the business community are awaking to the importance of purging trade of the cancerous malady which is so rapidly lowering the standard of commercial honor and poisoning the well springs of our national life. The rogues, the reckless speculators, the manufacturer careless of economy in his process or of excellence in his product, and the improvident, irresponsible tradesmen, have had their day. Now the honest man's turn has come, and if he still doubts the commercial value of a good name in business, it is because he has not as yet had occasion to test it. Perhaps our manufacturers and merchants who give credit have not bethought them, in their vigorous denunciation of dishonesty

and shiftlessness, that good might result from the bestowal of a larger encouragement upon tried integrity and sterling honesty. It does not follow, however, that these are not appreciated. We are, to all appearance, on the eve of a substantial commercial revival—not a season of speculative excitement, but, we may hope, one of substantial progress, characterized by a nearer approach to a cash basis. In any case, there must and will be a more careful scrutiny of credits, and those who have come through the trial with a clean record will find a good name worth more than all the brief advantage which could have been gained by a departure from the paths of rectitude into the devious and uncertain ways of fraud. Out of the too general demoralization in trade has grown a larger appreciation of honesty and integrity, and those who have been indifferent to a good name in past years will now find that the homely old proverb of Poor Richard has, after all, a substantial basis of truth.

American Beam Engines.

A story of ante-war times has been recently brought to mind by some developments in English steamboat building. The incident happened in this wise: An American firm had built a steamer of our well known river pattern, to run upon one of the Chinese rivers. With the lighter wood work carefully secured, she crossed the Atlantic in the early summer, and ran along the African coast. When well up the east shore she ran into a British station for coal and provisions, and found there a river steamer of English build, with short stroke engines, below decks, and the usual fittings of boats of her class. The two steamers were of about the same size and bound for the same part of the world. A vertical beam engine at sea was then a genuine novelty, and the American vessel had many visitors from the station. The engineer from the other boat came and looked; his criticism was characteristic. The machine "was nothing but a blasted pumping engine afloat." "Well," said the Yankee engineer, "we will pump so much water astern with that same 'blasted pumping engine' that we will put you 'hull down' before nightfall." And sure enough, starting together from the harbor a day or two after, the boast was made good. By noon the English boat was so far astern that she was hull down, only the smoke stack being visible from the deck of the American. The American steamers sent out to those waters were fast, economical and comfortable. The engines, though of strange fashion, worked on year after year with small repairs and under all sorts of disadvantages. They were easily handled, and won their way against prejudice and in the face of cheaper engines and cheaper boats. Even in this day of compound engines, high expansion and quick piston speeds, it is a very good machine which can surpass the American vertical beam engines, such as are used on our river steamers. These engines are at last appreciated, and we read in the columns of one of the best English engineering papers that "two of the most notable of the paddle steamers built upon the Clyde last year" were of the American type. "They" were the Kiang Kwang and Kiang Yung, "each of 2500 tons and 250 horse-power nominal. They were built by Messrs. A. & J. Inglis for river service in China, and were preceded by six others which were built by the same firm and fitted with beam engines on the American system. "These vessels have been eminently successful, and, indeed, they are the only vessels built in this country which have been able to compete with those sent out to the Yang-tze by the American ship-builders. They are generally of about 3000 tons gross measurement, and in them the American type has been closely followed, with the exception that the hull and engine framing are of iron instead of wood." According to the American method of rating an engine by the amount of power it will develop under normal conditions, these engines would be about 1500 horse-power.

It has been a prevailing notion in this country that in the line of marine engine building, etc., we were somewhat behind Great Britain. It is somewhat flattering, however, to learn that in another point our practice is being followed. In another part of the same article from which we have quoted, we find mention of the fact that upon the Clyde the practice during the last year has been tending toward the building of screw tugboats instead of paddle boats. Except for river towing, the paddle tug is a thing of the past and there are probably at the present moment not more than a dozen paddle boats in this harbor which are used for towing exclusively. These boats are mostly very fast, and are fitted with beam engines. They are used for transfer and similar services, the towing being rather incidental. The

largest of them, the Seth Low, can make 20 miles an hour, and is much used by regatta committees, etc. In power, the small and handy propeller is so far superior to the paddle boat that we wonder the latter have not long since been displaced on the other side of the water. What the state of the case is can be judged from the following sentences:

There is room to believe that a step in the right direction has been taken upon the Clyde in the construction of tugs to be worked by means of screw propellers rather than by paddle wheels, and in designing economical engines to actuate them. The latest effort in that direction is seen in the engines patented by Messrs. Rankin & Blackmore, and fitted into the screw tug Otter, lately built by Messrs. Duncan & Co., for a Port Glasgow firm. Much interest is felt in the success of that effort in practical work.

The result is easy to be seen, the paddle will go out, as utterly as it has here, and the screw will come in.

In shipbuilding American fashions are very likely to be followed in England, and it would be no matter of surprise if American river steamers were found one of these days upon English inland waters. After the America's victory in 1851, the curved cut-water came into universal use among English shipbuilders. Then the American ocean steamers adopted the straight bow without the bowsprit; not long after the whole world built steamers with straight bows, and if we remember rightly, the only ocean steamers sailing out of this port that have bowsprits are one or two vessels of the Cunard line. Now we learn that, "Probably the most novel feature in connection with the art of building ships that has come under notice on the Clyde during the last year" or so, is that of employing four masts "upon large sailing vessels instead of three, as a means toward lessening the risk of dismasting at sea, as also for convenience of working such ships," which is somewhat of a surprise, since Donald McKay built a four masted clipper ship years ago in Boston, and we had always supposed he was entitled to the credit of it, as he did it some many years ago, but it seems that "this improvement was first introduced by Messrs. Barclay, Curle & Co., into the 'County of Peebles,' a large sailing ship which they built for a Glasgow firm in the year 1875. For the same firm they have since built two duplicates of that vessel." Four masted ships were built in this country at least 25 years ago, so our friends are again following our examples, and in the right direction too.

Testing Iron and Steel.

On the 30th ult. the President sent the following message, upon the subject of testing iron and steel, to Congress:

I desire to call the attention of Congress to the importance of providing for the continuance of the board for testing iron, steel and other metals, which, by the Sundry Appropriation act of last year, was ordered to be discontinued at the end of the fiscal year. This board, consisting of engineers and other scientific experts from the army, the navy and from civil life—all of whom, except the secretary, give their time and labors to this object without compensation—was organized by authority of Congress in the spring of 1875, and immediately drafted a comprehensive plan for its investigations, and contracted for a testing machine of 400 tons capacity, which would enable it to properly conduct the experiments. Meanwhile the sub-committee of the board have devoted their time to such experiments as could be made with smaller testing machines already available. This large machine is just now completed and ready for erection at the Watertown Arsenal, and the real labors of the board are therefore just about to be commenced. If the board is to be discontinued at the end of the present fiscal year the money already appropriated and the services of the gentlemen who have given so much time to the subject will be unproductive of any results.

The importance of these experiments can hardly be overestimated when we consider the almost endless variety of purposes for which iron and steel are employed in this country, and the many thousands of lives which daily depend on the soundness of iron structures. I need hardly refer to the recent disaster at the Ashtabula bridge, in Ohio, and the conflicting theories of experts as to the cause of it, as an instance of what might have been averted by a more thorough knowledge of the properties of iron and the best modes of construction. These experiments cannot properly be conducted by private firms, not only on account of the expense, but because the results must rest upon the authority of disinterested persons. They must therefore be undertaken under the sanction of the government. Compared with their great value to the industrial interests of the country, the expense is very slight. The board recommended an appropriation of \$40,000 for the next fiscal year, and I earnestly commend their request to the favorable consideration of Congress. I also recommend that the board be required to conduct their investigations under the direction of the Secretary of War, and to make full report of their progress to that office in time to be incorporated in his annual report.

U. S. GRANT.
EXECUTIVE MANSION, Jan. 30, 1877.

This is timely. The importance of the work is great, while it is of such a character that we can only look to the government to carry it on. Every day demonstrates the need we have of a greater knowledge of the properties of iron and steel, when manufactured in large masses. Materials which show most extraordinary powers of endurance in one form are often weak in another; changes of structure take place and a variety of phenomenon occur for which we are at a loss to account or interpret. The labors of the board will give us what we want, and there is little doubt

but the needed funds will be appropriated by Congress.

Steel Rails.

We learn from the report of the Massachusetts State Commission on Railroads that during the past year 151 miles of steel rails have been laid in that State, making 1144 miles out of a total 3104 miles, or 37 per cent. of the whole. Everywhere the steel rail seems to be displacing iron, except perhaps in those instances where the head of the iron rail is exceptionally hard, and then one seems to wear as well as the other. Wherever there is a heavy traffic, or where the weight upon a pair of wheels exceeds a given amount, steel must sooner or later come into use. The wheel of an engine or car bears upon a very small surface, and the crushing force per square inch is often far greater than the head of the best iron rail is capable of resisting. In such a case lamination begins at once. The surface of the rail is destroyed wherever the wheel touches, and the destruction is rapid and certain, even though the rail itself be amply able to sustain the load. If, however, the rail head is sufficiently hard to resist the crushing action at the point of contact between the wheel and rail, lamination is entirely stopped and the wear of the rail from other causes is exceedingly slight. An example of the difference between hard and soft metal is often seen in the wheels under engines, the soft tires wearing with exceeding rapidity simply by the breaking down of the structure of the metal under the pressure—steel wearing admirably on account of its greater resistance to crushing.

Single Acting Engines.

No little attention is just now being paid in England to the single acting engine with from two to four cylinders. Perkins was, we believe, one of the first who used the single acting cylinder to obtain a high degree of expansion and economy with high pressure steam. Some of his engines, we believe, had more than four cylinders arranged in a line. The cylinders in the more common forms are arranged radially around the shaft. One inventor places them parallel to the shaft, however. The speeds are very high, and the power obtained from a small machine is consequently great, in spite of the fact that the cylinders are single acting. There being no piston rods nor guides, and but three moving parts to each cylinder, counting the valve connecting rod and piston, the construction is very cheap. As considerable measures of expansion are obtainable and the engine is very compact, they seem to be very promising. Several firms are engaged in their manufacture. It is hoped that they will combine all the supposed advantages of the engines with the advantages of the ordinary reciprocating engine. The forms which have been brought out abroad are certainly worth careful study.

New Publications.

THE CARPENTERS' AND BUILDERS' ASSISTANT AND WOODWORKER'S GUIDE. By Lucius D. Gould, Architect and Practical Builder. A. J. Bicknell & Co.

Mr. Gould is well and favorably known as the author of the "House Carpenter's Assistant," and a new work by him on practical carpentry will be received with satisfaction as a valuable addition to the literature of house building. Practically, it is a revision of the earlier work, now out of print, with much valuable matter added. Among these additions we notice a new and easy system of lines, founded on geometrical principles, for framing the most difficult roofs; for cutting joints and finding the sections of angular pieces; for finding the form of a raking mold; for the mitering of circular moldings, etc., etc. We also find useful tables of weights and cohesive strength of building materials, with a treatise on the adhesion of nails, screws, iron pins and glue; also an easy system of stair railing for straight and platform stairs. The book will be found of great practical value to architects, builders and carpenters, and contains a very clear and concise presentation of the theory and practice of constructive carpentry. The work is well illustrated with plates and diagrams. It may be ordered through this office, as announced in our department of book advertisements.

DRAINING FOR PROFIT AND DRAINING FOR HEALTH. By Geo. E. Waring, Jr. Illustrated. O. Judd & Co.

Col. Waring's book is a practical treatise on the drainage of lands, which should be carefully read by all who own real estate not naturally well drained. The writer has had an extensive experience in this kind of engineering work, and what he has learned is presented with a clearness and power which gives the treatise an interest for all classes of readers. The book realizes the promise of its title, so far as relates to land drainage. The chapter relating to town and house drainage has but little practical value. It is chiefly a digest of English contributions to the literature of sanitary science, but it adds nothing to the value of the book it certainly detracts nothing from it. The book may be had at this office, as announced elsewhere.

Better and Cheaper Steel.

We called attention in September to the exhibits and tests of the Fagersta steel and homogeneous iron in the Swedish Department at the International Exhibition. This metal was made by arresting the decarbonization of cast iron in a Bessemer converter, the iron being run in from the hearth of a blast furnace; the iron having been prepared in the furnace by smelting a prescribed mixture of ores, so that the steel property was obtained by decarbonization and without the use of ferro-manganese, speigleisen or cast iron at the end of the Bessemer process.

A patent was granted in this country in 1865 to James Henderson for this process. It has not gone into use here yet, as the steel makers thought it could not be used at large works, but as it is in use at Seraing and Creusot they will before long avail themselves of it, as it offers great inducements to adopt it. The steel used in this way is chiefly remarkable for its superior quality, and as the quality cannot be obtained by the use of speigleisen after decarbonization in the ordinary way, it is but fair to conclude that the quality is owing entirely to the process of preparing the iron in the blast furnace. Uniformity is the most valuable of its properties. In this respect it is better than the best kinds of Yorkshire iron, which are used in the specifications of engineers, and for strength and elasticity, combined with softness, it excels those kinds of iron and the steel made by the open hearth or Siemens-Martin process.

Bessemer steel made by the other method is so irregular in quality that it is generally considered unfit for any use than for rails. This is due to the irregular diffusion of the steel properties given to it by the speigleisen or ferro-manganese, and for uses where a trustworthy material is needed it is discarded and iron is used instead.

The following table of tests gives the extreme lowest and highest tests of the Fagersta soft steel or homogeneous plate iron, and plate iron of the celebrated Yorkshire makers, which are generally specified by British engineers, and which when used relieves everyone from legal responsibility as to quality of materials. The tests in both cases were made by Kirkaldy:

	Fagersta Homogeneous Iron Plates.	Yorkshire Plate Iron.
Ultimate stress, 55,808 lbs. per sq. in.	40,412 lbs.	
Contraction of area, 50.0 per cent.	7.9 per cent.	
Stress per fractured area, 111,606 lbs.	44,025 lbs.	
Elongation, 36.4 per cent.	6.7 per cent.	
Ultimate stress, 52,475 lbs.	54,513 lbs.	
Contraction of area, 61.7 per cent.	29.9 per cent.	
Stress per fractured area, 163,108 lbs.	77,777 lbs.	
Elongation, 44.7 per cent.	20.9 per cent.	
Bulging stress, all uncracked, 33.3 per cent.	33.3 per cent.	
Cracked or burst, none	66.6 per cent.	
Thickness, 300 inch	308 inch.	
Bulged, 2.30 inch.	2.30 inch.	
Ultimate stress, 164,880 lbs.	133,033 lbs.	

The variation in quality from the lowest to the highest tests of the Fagersta homogeneous iron or steel is 46 per cent. per square inch of stress per fractured area, while with the iron plates it is 76 per cent. In the elongation or elasticity the Fagersta varies but 34 per cent., while the iron varies 300 per cent., or nearly ten times as much. That these tests of Fagersta iron are not exceptional was evidenced by the numerous certificates published by the Fagersta Company of different firms that use it.

Soft steel made at the Otis Steel and Iron Works by the Siemens-Martin process, the highest test of quality gave 144,444 lbs. per square inch stress per fracture, area; the ultimate stress was 49,000 lbs.

The process produces steel or homogeneous iron cheaper than any other, as the metal being taken from the hearth of the blast furnace to the converter, saves the waste of remelting pig iron in a cupola, amounting to 5 per cent., and of extra cost of speigleisen and the waste of melting it, and the labor and fuel of the cupola, which in all amounts to about \$5 per ton of steel. The cost of manufacturing the ingot of steel by this process is merely the cost of iron and waste of decarbonizing it and the labor and fuel attending the use of the Bessemer apparatus, but exclusive of interest, repairs and superintendence, which will be the same by either process of making Bessemer steel.

The following excerpts from the Henderson patent gives an explanation of the manufacture:

"My invention relates to an improvement in the manufacture of iron or steel by the pneumatic process, generally known as the Bessemer process, and my said invention consists in combining with the said pneumatic process for decarbonizing crude molten iron; the preparation of the crude molten iron to be thus decarbonized by mixing with iron ores and other materials, charged in the usual way at the tunnel head of the blast furnace, a given quantity of manganese, or by preference manganiferous iron ores, such as that known in this country by the name of red oxide of zinc, or Franklinite, known at present to exist in the greatest quantity in New Jersey, but other iron ores rich in manganese, such as spathose, or spathic carbonate may be used instead where they are free from sulphur and phosphorus, or any other iron ores in combination with manganese from which the metal known as 'speigleisen' may be made.

"The object to be gained by thus mixing in the blast furnace is that the manganese, or ores or metal containing manganese in sufficient quantity, may be smelted at the same time as the other ores with which the furnace may be charged, that there may be found combined with the iron in the state of fusion in the hearth of the blast furnace a sufficient quantity of manganese to insure its being in a fit state to be treated directly from the blast furnace by the pneumatic process for making steel from crude cast iron.

"The mode of procedure is to run the

molten iron from the blast furnace in the decarbonizing vessel, and then at once treating it by the pneumatic process; in every respect similar to the mode now practiced in what is known as the Bessemer process of making steel from crude iron by means of currents of air blown up through and among the metal.

"The quantity of manganese ores will vary with the quantity of manganese they contain, and the character of the other ores and materials with which they may be smelted. Very pure ores, such as the richer and better qualities of Lake Superior ores, or the red hematites of Cumberland and Lancashire, England, will require less than where ores of an inferior quality are used, and will necessarily depend on the skill of the workmen, assisted by frequent careful analyses of the materials used, all of which should be as free from sulphur and phosphorus as possible.

"The advantage of my said improved process is that the manganese, the presence of which in the pneumatic process of decarbonizing is known to be essential, if not indispensable, is more thoroughly incorporated with the molten iron than when introduced in the crucible in which the pneumatic process is operated, and being more thoroughly incorporated, and being present from the very beginning of the pneumatic process for decarbonizing, it exerts its beneficial influence more effectively than when introduced toward the end. When sulphur and phosphorus are found in the materials a larger quantity of manganiferous ore will be needed to overcome these deleterious substances, and the same rule will apply when there is an excess of silica in combination with the ores.

"All of the ores used in the smelting operations will be found to work better when reduced to about egg size. From the above explanation it will be seen that the principle upon which the invention is founded is the application of manganese or manganiferous iron ores to be operated upon or smelted with other iron ores in the furnace, so that when in the state of fusion it can be directly decarbonized and refined by the pneumatic process."

The claim is: "Mixing manganese or the equivalent thereof, with the ore or ores charged in the blast furnace for smelting, in combination with and to produce crude molten iron to be directly converted by the pneumatic process, substantially as and for the purpose specified."

A mixture of ores and flux of the following chemical composition will give good results:

	Per cent.
Silica	10.0
Alumina	2.50
Lime	7.51
Magnesia	2.75
Protoxide of manganese	5.50
Iron	30.00
Sesquioxide " "	45.00
Phosphoric acid	.01
Carbonic acid	6.63
	100.00

The cast iron made from the above will contain:

	Per cent.
Carbon combined	8.45
graphitic	1.80
Silicon	.75
Manganese	4.50
Phosphorus	.02
Sulphur	trace
Iron by difference	10.02
	99.98
	100.00

Analyses of the steel made by this process are given below:

	Carbon pr. ct.	Silicon pr. ct.	Manganese pr. ct.	Phosphorus pr. ct.	Sulphur pr. ct.
Steel for soft plates, railway axles, &c.	0.085	0.008	trace	0.025	trace
Steel for gun barrels, shafts, &c.	0.25	0.036	0.234	0.022	trace
Soft steel for tools, saws, &c.	0.70	0.032	0.256	0.023	trace
Hard steel for tools, chisels, turning tools, &c.	1.05	0.067	0.355	0.028	trace

The following table gives results of tests of the steel for gun barrels and tools, with tests of best crucible steel for comparison tests made by Kirkaldy:

Steel for Gun Barrels, Shafts, etc., Rolled.

	Fagersta.	Krupp's and Sheffield Cast Steel.
Ultimate stress, 54,560 lbs. per sq. in.	92,015 lbs. per sq. in.	
Contraction of area, 69.7 per cent.	31.0 per cent.	
Stress per fractured area, 180,000 lbs. per sq. in.	189,434 lbs. per sq. in.	
Elongation, 27.8 per cent.	15.3 per cent.	
Appearance of fracture, 100 per cent. silky.	49 per cent. granular, and rest fibrous of a very fine silky luster.	

Soft Steel for Tools, Hammered.

	Fagersta.	Krupp's and Sheffield Cast Steel.
Ultimate stress, 53,720 lbs. per sq. in.	101,151 lbs. per sq. in.	
Contraction of area, 44.7 per cent.	28.8 per cent.	
Stress per fractured area, 151,030 lbs. per sq. in.	142,070 lbs. per sq. in.	
Elongation, 16 per cent.	10.8 per cent.	
Appearance of fracture, 100 per cent. silky.	94 per cent. granular, and rest fibrous, of fine silky luster.	

Hard Steel for Tools, Hammered.

	Fagersta.	Krupp's and Sheffield Cast Steel.
Ultimate stress, 123,090 lbs. per sq. in.	134,832 lbs. per sq. in.	
Contraction of area, 10.2 per cent.	17.0 per cent.	
Stress per fractured area, 136,700 lbs. per sq. in.	153,243 lbs. per sq. in.	
Elongation, 5.3 per cent.	7.1 per cent.	
Appearance of fracture, 100 per cent. granular.	100 per cent. granular, very fine.	

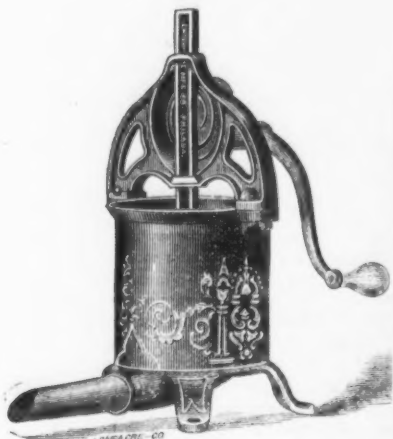
The iron ores from the Iron Mountain, of Missouri, will make still better steel than the foregoing as regards softness, as those do not contain any phosphorus.

The Fagersta steel exhibits were presented to the American Society of Mining Engineers, and are placed in their museum in Memorial Hall, Philadelphia.

Works of ENTERPRISE MANUFACTURING CO. of PA.,

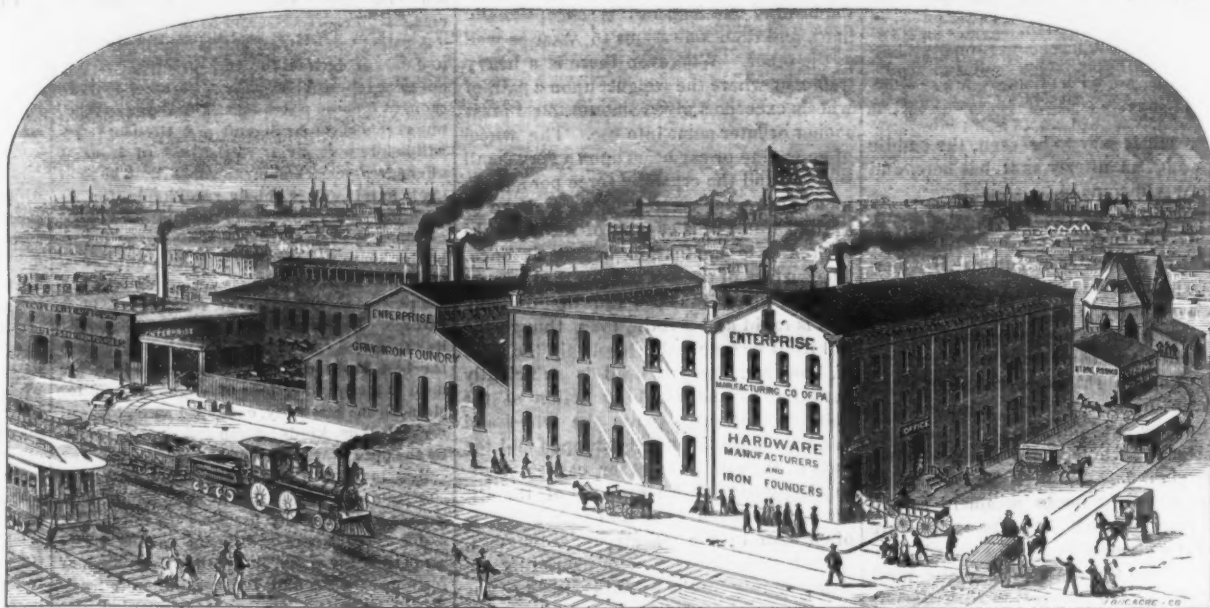
S. W. Cor. American & Dauphin Sts., Philadelphia.

PATENTED HARDWARE MANUFACTURERS.



SAUSAGE STUFFER.—Closed.

Showing Sausage Stuffer, Fruit, Lard and Jelly Press closed.

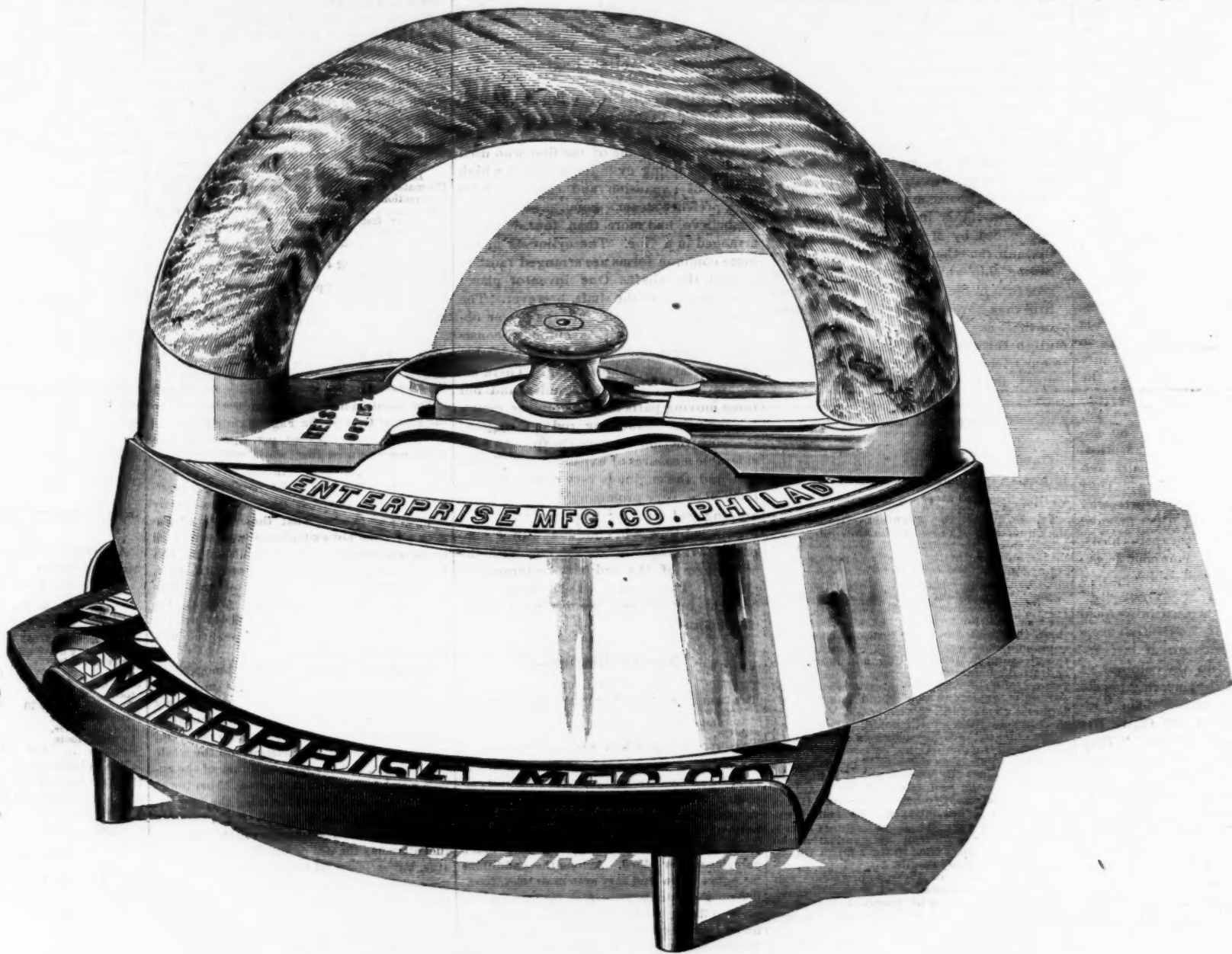


SAUSAGE STUFFER.—Open.

Showing Sausage Stuffer, Fruit, Lard and Jelly Press open.

MRS. POTTS' COLD HANDLE, DOUBLE POINTED SMOOTHING AND POLISHING IRONS.

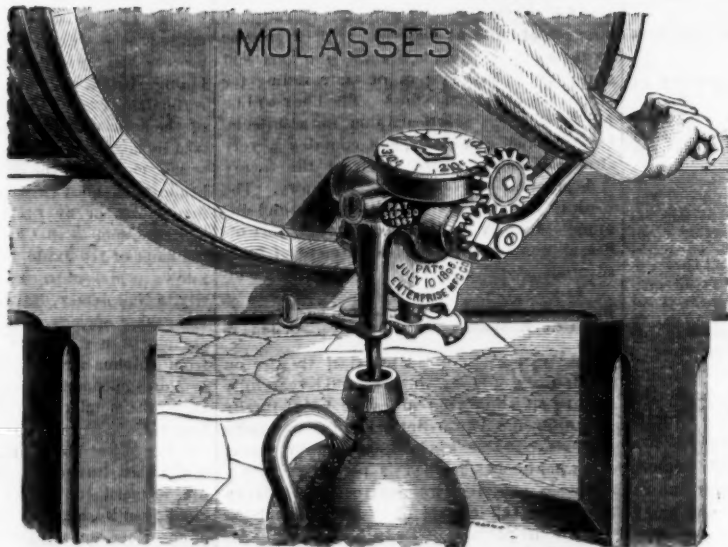
They require no holder or cloth, are lined with non-conducting fire cement, and ground by patent improved machinery. They are of various styles and prices.



Three irons, one handle and a stand constitute a set. They are furnished either nickel plated or plain polished, as desired. These irons are patented both in the United States and Europe.



Star Iron with Perforated Handle not detached.



Patent Suction and Force Measuring Faucet.

Warranted to measure correctly, and draw a gallon of the heaviest molasses in winter in one minute.



Chinese Polishing and Glossing Iron, the best in the Market.

Send for Illustrated Catalogue and Price List, describing these and other valuable articles.

PATENTED
ST. LOUIS STAMPING CO.,

GRANITE IRONWARE

MAY 30, 1876.
ST. LOUIS, MO.



All Goods Marked
FOR SALE

Granite Iron Ware.
EVERYWHERE.

GRANITE IRON WARE IS THE ONLY SUITABLE HOUSEHOLD WARE MADE.
Represented in New York by the WIEBUSCH & HILGER HARDWARE CO., Nos. 84 and 86 Chambers Street.

C. A. & W. L. TEAL,

No 4116 Ludlow Street, PHILADELPHIA, Manufacturers of

**IMPROVED BOILER ROLLS, COMBINED PUNCHING AND SHEARING MACHINES,
SINGLE POWER PUNCHING MACHINES, with Shearing Attachments,
FISH-BAR PUNCHING MACHINES,**

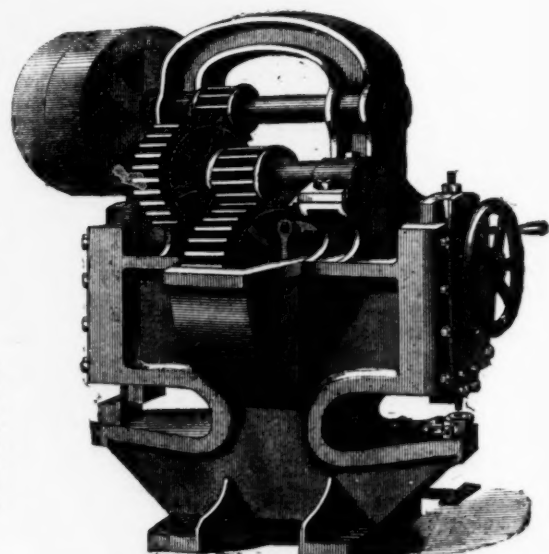
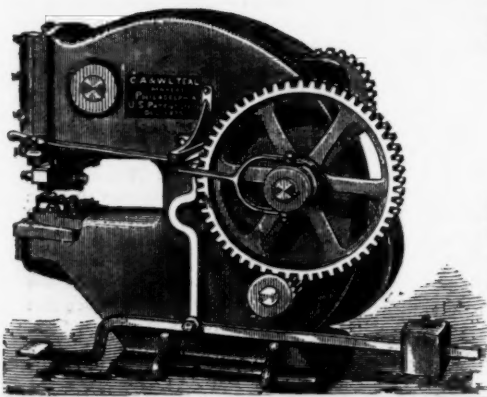
To punch four (4) holes and cut off the bar at one stroke.

**Steam Riveting Machines, Boiler Makers' and Machinists' Post Drilling Machines,
AND MACHINERY IN GENERAL.**

COMBINED PUNCH AND SHEAR.

Our regular pattern for boiler makers will punch and shear in the center of 40 inches, will punch $\frac{1}{4}$ inch hole in $\frac{1}{4}$ inch iron, and shear $\frac{1}{4}$ inch plate; is provided with an automatic stop motion for Punch "Head" that can be set by the operator to stop the punch at any point of the stroke; as for different thicknesses of iron the punch can be set to stop within $\frac{1}{2}$ of an inch of the iron after punching the hole, where it will rest until the work is adjusted for the next hole and the clutch thrown in. Is also provided with an adjustable stripper, a gauge and two "rests," one on each side of the die to support the work. Shears run while the belt is on the tight pulley, but the punch can be operated by the clutch. When desired, punch end of the machine is provided with heavy bolts, giving ten inches reach to center of punch, and will punch 1 inch hole in 1 inch iron. We also make this machine with 12 inches reach on punch end, to punch 1 inch hole in 1 inch iron, and with shears set on an angle for splitting sheets and cutting off bars.

Our small pattern for boiler makers will punch 18-16 inch hole in $\frac{1}{4}$ inch iron, 15 inches from the edge, and shear $\frac{1}{4}$ inch plate 15 inches from the edge, is made for either hand or steam-power or both.



COMBINED PUNCH AND SHEAR.



THE COWLES HARDWARE COMPANY, Unionville, Conn.
Manufacturers of **HARDWARE AND HOUSE FURNISHING GOODS.**

GEO. DUNHAM, Pres't. G. S. KNAPP, Treas. MARTIN COWLES, Sec.

Screw Drivers of all varieties, Box Scrapers, Box Openers, Garden Hoes, Garden Trowels, Border Knives, Mining Knives, Fish Turners, Butter Knives, Cake Turners, Cleavers, Hammers, Carpet Stretchers, Tack Claws, Marking Awls, Carpenters' Awls, Belt Awls, Ice Awls, Carriage Jacks, Nail Sets, Bush Hooks, Ice Axes, Ice Tongs, Patent Mouse Traps, Vegetable Slicers, Bit Braces, Butts and Spiral Springs, Ferrules, Ham Tryer, Ham Stringers, Oyster Knives, Cold Chisels, Handles, Solid and Prick Punches, Box Hooks, Bow Pins, Bull Ring Needles, Bull Rings, Bill Hooks, Blind Adjusters, Curving Irons (Wrought), Cork Stoppers, Oatmeal Leaders, Corn Hooks, Door Springs, Knives (Kitchen), Saw Sets (Hart's Patent), Saw Sets (Aiken's Patent), Saw Sets (Improved Bench), Spoons (Table and Tea), Washers (Tin and Iron), Knob Rings a specialty, and **IMPLEMENT SCREW DRIVERS.** Catalogues and Circulars sent on application.

J. CLARK WILSON & CO., Agents, 81 Beekman St., New York. SAMUEL G. B. COOK & CO., Agents, Baltimore, Md.

WILEY & RUSSELL MFG. CO.



THE LIGHTNING SCREW PLATE.

Hand and Power Bolt Cutters and Pipe Threaders, Drilling Machines, Tire Upsetters, Fine Friction Clutches, &c., &c.
FRASSE & CO., Agents, 62 Chatham Street, N. Y.
Importers of and Dealers in
Stubs' Tools, Files, Bright Round Steel Wire, Bar & Sheet Steel, &c.
Best Piercing Saws for Scroll Sawing. French, German, English and American Tools, Files, Steel Wire and Supplies. Agents for the **ALMOND DRILL CHUCK.**

SNYDER'S LITTLE GIANT STEAM ENGINE

The Best
SMALL
POWER ENGINES
IN THE COUNTRY.

One-Horse Power, with tubular boiler complete, only... \$150.
Two-Horse Power... 200.
Three-Horse Power... 250.

Manufactured by
WARD B. SNYDER.
94 Fulton Str.,
NEW YORK.

Call and Examine
OR SEND FOR
AN
ILLUSTRATED
CATALOGUE.

**\$35,000
SAVED
AT
ASHTABULA!**

Eight of the victims of this terrible catastrophe were insured against accidents in the

**TRAVELERS INSURANCE CO.,
OF HARTFORD, CONN.**

Louis J. Barnard, Buffalo, traveling agent... \$5,000
Henry Wagner, Syracuse, sleeping-car conductor... 5,000
Boyd L. Russell, Auburn, N. Y., commercial trav... 5,000
Levi W. Hart, Akron, Ohio, commercial agent... 5,000
Mr. Hart had also a Life Policy for... 3,000
Silas H. Merrill, Dayton, N. Y., traveling agent... 5,000
Jonathan Rice, Lowell, Mass., merchant... 4,000
G. A. Furthong, Buffalo, Adams Express messen... 2,000
F. W. Marvin, Buffalo, commercial agent... 1,000
Total, so far as known... \$35,000

Mr. Barnard's Accident Policy was written only two hours before his departure on the ill-fated train, and cost \$27.50. The eight accident policies cost only \$250.00.

Accident Insurance, procured by the timely investment of a very little money, brings incalculable relief to the bereaved and suffering in case of fatal casualty or bodily injury.

THE TRAVELERS has paid in cash benefits to its Accident Policy holders over

\$2,500,000.

Every man, traveling or not, should secure the cheap and sure protection of a

Yearly General Accident Policy.

Any regular agent will write one at a few minutes notice.

New York Office, 207 Broadway.

The National Association of Stove Manufacturers.

Sixth Annual Meeting.

THURSDAY, JANUARY 18, 1877.

The meeting was called to order by the president at 10:30 a. m.

The President: I understand Mr. Boynton, of New York, is prepared to make some remarks or suggestions in regard to trade-marks. It would be agreeable to the Association to hear from Mr. Boynton at this time.

Mr. Eddy: Mr. President, with your permission and that of Mr. Boynton, I desire to say that two of our brethren were last evening called from us by the unexpected death of their father. I refer to the Hubbell brothers, of Buffalo, who have always been members of this Association, and joined with us upon these occasions. I move that the sympathies of this Association be extended to them in their affliction, and that the secretary be requested to convey the same.

The President: The president received the intelligence of the death of Mr. Hubbell from apoplexy, and the Messrs. Hubbell immediately returned to Utica.

Mr. Eddy's motion was then adopted.

Mr. Boynton: Mr. President, I have no particular remarks to make, only to say that Mr. Richardson conferred with our attorney, who drew up a little article embodying an amendment to the bill which was introduced in Congress. It is suggested that possibly this might be added to that bill. With your permission I will ask that the secretary now read it.

The secretary read the same, as follows:

"That any person who shall, with intent to defraud, deal in or sell, or keep or offer for sale, or cause or procure the sale of, or manufacture or furnish for sale any goods or articles of merchandise which are substantially similar to material or operative part or parts of any goods or articles of merchandise to which is affixed any trade-mark registered pursuant to the statutes of the United States, for the purpose and with the intent that the same shall be incorporated therewith or used therein under said trade-mark, knowing the same to be counterfeit and not the genuine material or operative part or parts thereof, shall, on conviction thereof, be punished as prescribed in the first section of this act, and shall also be liable to an action in the case of damages therefor, at the suit of the owner of said trade-mark, in any court of competent jurisdiction in the United States; and the party aggrieved shall also have his remedy according to the course of equity to enjoin the same, and to recover compensation therefor in any court having jurisdiction over the person or persons guilty thereof."

Gen. Rathbone moved its reference to the standing Committee on Patents. Adopted.

Mr. Olhaber: That reference to the committee cuts off any discussion, I understand. The gentleman on my left (Mr. Filley) desires to ask some questions in regard to it.

The President: We will consider ourselves under the "good of the Association" rule, and any remarks will be in order.

Mr. Filley: I would like to inquire whether the statement just made by Mr. Boynton would cover stoves other than those which are covered by a trade-mark? Now, there are many belonging to this organization having stoves not covered by a trade-mark upon which they might obtain a trade-mark patent provided they had a right to; but, as I understand it, there are none covered except those first covered by a trade-mark.

Mr. Boynton: In reply I would say that I suppose that depends upon how the term "trade-mark" is construed, or what constitutes trade-marks. I have here a comprehensive digest on trade-marks, and it has reference to Senator Conkling's bill. Our attorney fully understanding the scope of this new bill drew this up as an amendment to the bill, as the new law, in his opinion, did not quite cover what we wish to accomplish. I presume some members present have a copy of this. If not, I will leave it with the secretary.

Mr. Filley: If I understand the law of trade-marks, or the principle upon which that law depends, the right of trade-marks does not depend upon any trade-mark. The United States, through Congress, simply gives a right to sue in the United States courts instead of the State courts; but it grants no new rights at all. Any party is entitled to the use of any trade-mark he chooses to adopt, in any country, without any law. The law of Congress simply gives the right to sue in any part of the United States, but it gives no right in the trade-mark itself.

Mr. Merriam: Does not the law that has been passed, or that is referred to, and which I suppose to have been passed in regard to plates, embrace all the points Mr. Filley desires to cover, irrespective of the trade-mark or name? I suppose all those points have been covered in the law, although I have not seen the law and know nothing about it; and I suppose this is simply an amendment to that law, perhaps, which covers all the points you desire.

Mr. Filley: I would like to know whether a party can claim protection in the plates which he makes without obtaining a trade-mark upon the stove itself. If I understand it, the separate plates of a stove are not subject to a trade-mark. You cannot be protected under the law of trade-marks. If I understand the proposition offered, these plates will be covered under any trade-mark that a party might wish to obtain or has obtained.

Mr. Merriam: Is there any gentleman of the committee upon this subject here that can answer what the scope of the law is in relation to covering plates?

The President: The chair understands Mr. Boynton that the law requires amending in the opinion of his firm's counsel, and that this amendment covers the deficient point.

Mr. Boynton: It may be known to some of the gentlemen that something like a year ago, or possibly more than that, we commenced suit against several founders in New York and vicinity for filing up our plates and making castings, and supplying goods. It was at first thought by our attorney that we could not stop such manufacture, and that there was no law bearing upon this subject by which we could stop them. However, after looking the matter over and consulting with some of the judges in New York, the conclusion was arrived at that there were precedents in the old English law— from which our laws are derived—by which it could be done. We accordingly commenced proceedings and obtained injunctions restraining the founders from making repairs for our stoves. We have found one party ready to test the question. There are four brothers of them. And when we get a case about ready to come into court one brother sells out to his other brothers. Then we take the next brother and treat him in the same manner, and he sells out. But I believe they have got nearly to the end of the brotherhood. [Laughter.] I don't know what we may accomplish when we get through, but there seems to be good ground in the opinion of our attorney, and of several of the judges in our neighborhood, for believing that we have a good and equitable cause against them. But this new law is supposed to be defective so far as applicable to what we desire of it; hence the drafting of this article as an amendment, which it is presumed would be attached to the bill, and thus the law amended without any great difficulty. Then, on the passage of that amendment our lawyer advises us that he will have no difficulty, he thinks, in restraining people from making such repairs.

Mr. Warren: I would ask who the Committee on Patents are at present?

The President: I have reappointed the previous committee, consisting of the following gentlemen: I. A. Sheppard, Philadelphia; Chas. Eddy, Troy; A. E. Chamberlain, Cincinnati; H. A. Richardson, New York; W. H. Tefft, Detroit.

Mr. Merriam expressed the hope that gentlemen having any well defined views on this subject would confer with Mr. Eddy.

Mr. Eddy thought the reference improper, and that the Association should take the experience of Mr. Boynton and his counsel as a guide in their actions; he therefore moved that the bill be referred back to the counsel, as it would be impossible for the Committee on Patents to get any better light on the subject than that already furnished by Mr. Boynton.

Gen. Rathbone: I move its reference to that committee, and all they have done and all that has been done in the matter. This law, which seems defective, was secured by our Committee on Patents; at least they have taken a very decided interest in it. At the Philadelphia meeting, Mr. Richardson reported that in consequence of this law the manufacturers of New York had sold four times as many odd plates as before; that it had been a check upon those who had been in the habit of using grates, etc., as patterns.

Mr. Boynton said that Gen. Rathbone was laboring under a misapprehension. The law in itself had no reference to stove manufacturers, but was passed in the interest of champagne manufacturers to prevent counterfeits and imitations. It is thought by our counsel that this amendment will cover our branch of business, and the suits we brought were not brought under this law, but under old English precedents. There has been no case brought to a final termination. So far they have all, except in the case referred to, backed down and given it up.

The president suggested that Mr. Eddy's object could be accomplished by a motion directing the Committee on Patents to procure the passage of the amendment.

Mr. Merriam asked that Mr. Boynton be appointed on the committee, but Mr. Boynton declined, as his partner, Mr. Richardson, was already a member of the committee, which answered the same purpose.

Mr. Bush: At Cincinnati there are two small firms that have been taking our grates and using them as patterns, and issuing circulars that they would sell certain plates of our stoves for 3½ cents a pound. A committee was appointed by our local association to investigate the matter, and the subject was submitted to an able attorney, who has given his opinion that we can recover damages and put a stop to this wholesale thieving. There are small manufacturers who are making a living by stealing these patterns and offering to sell plates that belong to us.

Mr. Boynton: In New York a family consisting of several brothers have opened, or were to open this week, a store in Water street, under the name of the New York Repair Company. The object of their establishment is to supply repairs of all kinds for all kinds of stoves and furnaces. Their present price is 6 cents a pound. They think to evade the law by designating their articles by numbers. If a customer should ask them if they had a grate for a "Splendid," they would say, "Oh, no; but we have a grate number 16 which will fit it and answer the same purpose." They have undertaken this scheme with an idea, evidently, of doing a thriving business.

The president suggested that if the passage of this amendment was desired, the committee should be instructed to push it. If left six months longer it would be too late for any action of the present Congress.

Upon motion of Mr. Warren, the committee was thus instructed.

Mr. Sard, chairman of the Committee on the President's Address, made his report.

The report was accepted, and the recommendation taken up for consideration *seriatim*.

The secretary read as follows:

First.—That in the present depressed condition of business we must recognize the fact that the demand for stoves has fallen off, and that a less amount of business must be done than formerly; hence, we recommend that each firm accept the situation, and reduce their production to a less amount than in former years.

Mr. Tefft thought this recommendation a little vague. He suggested it would be well to state what percentage of reduction should be made during the coming year.

Mr. Merriam thought that this vagueness was intentional on the part of the committee; it would be impossible for them to make a more specific recommendation. For one, he would recommend his house to look over the probable future, and only manufacture as many as they thought they could sell. As for making goods this year to carry over until next year, he did not think he could pursue that policy.

Mr. Hill said the committee had in view the reduced capacity of the purchasing community. We could hardly say that we could recommend the whole trade to reduce one-quarter, a half, or three-quarters, or any other fixed percentage. In view of the different situations and circumstances of the various manufacturers, it must be left to the discretion of each to provide his own market with a sufficient amount of goods.

Gen. Rathbone hoped that the recommendation would be adopted. It seemed to him that one reason why manufacturers were not more successful in 1876 was over-production. Too many stoves had been made and the market was glutted. He had observed as the result of his experience that when there is an excess of anything in the market, the price must fall, and sharp competition is the necessary outgrowth, with correspondingly low profits. During the past few years many important changes have been introduced to the trade. One of these is the frequent change of patterns—so frequent that the retailer in the country buys his stove one year with no assurance that there will not be another change in the design next year. The result is that the manufacturer, and not the dealer, carries the stock. To illustrate, about two years ago we had a heating stove that we thought was perfect, but we were compelled to change it or lose our customers. We had on hand 300 or 350 and offered them to our customers, but could not dispose of them. We were obliged to throw away all the parts that had been changed, and thus we had to make a new article. As the president said yesterday, "These are perilous times." I look on the business for 1877 as not particularly promising, and to restrict production is indispensably necessary. The retailers have learned a lesson that we are to carry the stock, not them.

The recommendation was adopted.

The secretary then read the second recommendation as follows:

Second.—That while we think that the president has overestimated the amount of stoves placed with dealers "to be paid for when sold," we cannot in too strong terms denounce the practice of delivering any stoves on that plan.

Adopted without debate.

The third recommendation was then read: Third.—That we recognize the system of employing traveling salesmen as a necessity to the business which cannot be dispensed with; and we recommend that the persons who are most familiar with the cost shall give less latitude to salesmen in the matter of prices, terms, &c.

Adopted without debate.

The fourth recommendation was then read: Fourth.—That, while opinions may vary as to the comparative cost of manufacturing stoves in different localities, we must recognize the fact that no section is barren of advantages over others, and that any such differences or advantages are too inconsiderable to justify any difference in prices.

Adopted without debate.

The fifth recommendation was then read: Fifth.—We recommend that the Association endorse the views of the president regarding the repeal of the bankrupt act and compromising accounts.

Mr. Merriam thought that these recommendations should be discussed at greater length.

Mr. Hill said it did not enter into the minds of the committee that there should be no compromise of an account. It was thought best to bring it up again after what has been said by the president. The stove business is done in a very loose manner, and there are many abuses in it which call for reform. He did not favor very harsh measures with unfortunate debtors, but thought the time had come when dealers should be given to understand that no man who could pay his debts would be allowed to compromise them.

Mr. Spear alluded to the action of the Association at Philadelphia on this question, and recommended that there should be no compromise with a debtor until his affairs have been sifted to the bottom. The adoption of this recommendation is all well enough, but we should conform to it strictly. For my part, I made up my mind two years ago not to compromise with any man unless he had met with a misfortune. I have carried out my purpose to the letter, and if a man has succeeded in making a compromise I have refused to sell him afterward. I think if all would act upon this plan we should have fewer compromises and much fewer failures.

Mr. Whitehead said it was formerly his practice to accept the first offer that was made by a debtor wishing to settle. Since the meeting at Philadelphia he had abandoned that policy, and when a compromise was offered had taken time to investigate the circumstances. One man who offered 37 cents, after investigation offered 50. We took the 50, but he never got any more stoves of us.

Mr. Fuller said he was not prepared to say that he was opposed to compromise, but that great care should be exercised in signing such releases. It was the rule of the late A. T. Stewart never to compromise. He did not take time to look into the state of the debtor's affairs, and made it a rule never to take less

than 100 cents on a dollar with interest. Consequently, whoever wanted to compromise kept very clear of Mr. Stewart.

Mr. Merriam said he had a case in mind of a firm formed within a year. Representations were made that the men were worth about \$20,000 capital, together with the money they put into the concern, and that they were good for \$20,000. Unfortunately, parties with whom I was connected "took stock," as they say, in these representations, and here the other day they failed. No, I am mistaken, they have not failed—some one connected with them has failed, and they were ready to fall when they came to it. Now we are making an investigation we should have made in the first place, and find that they were never worth a dollar.

The president said he was familiar with two or three very marked cases of attempted compromise which might interest the members. In 1857 we passed through one of the most terrible panics ever known in this country. One of the staunchest houses in the West had passed through the whole year and well into 1858. At the eleventh hour they made up their mind they might as well make some money compromising as well as their neighbors. They called on the firm with which I am associated, and stated their case. I heard them through and then asked the cause of their failure, which was stated very definitely. I happened to know some of the facts, and said: "I do not think this question needs any further discussion. I shall not accept the compromise." The firm owed us several thousand dollars, and in a few weeks I wrote a note asking them to send so much money on account. The money came without a word. I repeated this until we got every cent of the money. They continued to buy of us after that as long as they were in business, which was several years. They did not dare to buy anywhere else.

I know another case where a party failed for a very large amount, and offered 40 cents on the dollar. Your present secretary went there to investigate the case and came home satisfied that the failure was fraudulent. They kept writing to us and we made no reply. Presently the party came down with the assignee, who was a professional. I heard all they had to say, and when they were through replied: "This is a case of fraud. I know all about it. You can go home." A few weeks later they paid us 75 cents on a dollar.

General Rathbone said: I regard the action of the Association at Philadelphia last summer upon this question as well considered and urgently necessary. The president alluded yesterday to the fact that he had received one or two letters from prominent dealers in the country approving the action of the Association. I received letters of the same character; one I particularly remember, in which the writer said he thanked the Stove Founders' Association for having taken this high ground. As I understood our action last summer, it was this: That inasmuch as attempts to secure compromise were becoming very frequent, and a majority of them were fraudulent, the time had come when the Association must take positive and decided action to counteract the impression among dealers that they could make more money rapidly by compromising their honest debts than in any other manner. I believe we have had less offers of compromise in consequence of our action last summer, which was brought prominently to the notice of the whole trade by *The Metal Worker*. I think there are very few members of this Association who would not help an honest but unfortunate debtor to get on his feet again, but all debtors are not of this class. During the past few years failing and compromising has become a trade. It is our duty to put a stop to this; a duty which we owe to ourselves and to those who pay us for the goods they buy. I should rather lose every cent of a debt due me if I believed the man to be a rogue and a scoundrel and trying to cover up his property, than to compromise with him for 30, 40 or 50 cents. The effect of this Association is positive in its character. We have accomplished a great deal, and when the stove makers of the United States, in convention assembled, give forth to the public the fact that they stand upon high moral ground, the results will be positive in their character.

After some further discussion the recommendation was adopted by a rising vote.

The secretary then read the sixth recommendation as follows:

Sixth.—That the secretary be requested to furnish members each quarter a list of the new names of stoves that may be registered.

Adopted without discussion.

The secretary then read the seventh recommendation as follows:

Seventh.—That Article 4 of the Constitution be amended, omitting the semi-annual meeting. Referred to the June meeting for action.

The secretary then read the eighth recommendation as follows:

Eighth.—That Section 5 of the By-laws shall be amended, limiting the amount of the annual assessments upon each member to \$20.

Adopted without debate.

Mr. Eddy desired to say a few words on the third recommendation in regard to traveling men. He did not like the expression "less latitude," and he wanted it made somewhat more definite.

Mr. Sard, as chairman of the committee, was willing to make any change in the wording which might meet Mr. Eddy's views. We must give our traveling men some discretion. He did not think any manufacturer sent a traveler out with a cast iron price list that was not to be varied from under any circumstances.

Mr. Hill said the travelers were a very worthy and competent set of men. They were not blamed except when they exceeded their limits. Every manufacturer who sends out men should know them well, and give them distinct instructions not to leave a wide latitude

in regard to price lists or terms, for it brings about great confusion.

Mr. Boynton agreed with Mr. Hill.

Mr. Cribbens said he had himself traveled a number of years, and that the trouble lay principally with the manufacturers. Travelers should receive distinct instructions, and not be allowed to exceed them.

Mr. Eddy moved that the words "shall give explicit instructions" be substituted for "less latitude" in the third recommendation.

The amendment was adopted.

Mr. Fuller asked whether the time had not come when manufacturers were ready to give up selling stoves at a long price, taking off a discount of 40, sometimes 50, and he had often heard of 60 per cent. He urged the adoption of a resolution recommending the sale of goods at net prices, with all variations in dollars and cents.

Mr. Sard said the Association had taken such action in Philadelphia, and it was said at the time that many had already issued their lists based upon the old system. He thought it well that the sense of the meeting should be taken on this subject.

After some discussion, the subject was referred to the committee, with instructions to report upon it without delay.

In the meantime the subject was informally discussed, and an informal vote taken on the question of reaffirming the action of the Association at Philadelphia with regard to long and net prices was taken, showing a large majority in favor of it.

Mr. Sard: By direction of the Association, your committee have retired and make the following report in regard to prices:

The prices at which stoves have been sold during the past year it is well known have been unremunerative. There is such difference in the finish of the various goods that they cannot be classified and a scale fixed upon. A basis of weights is impracticable. We therefore recommend that the prices for the coming year be made with reference to the losses of the past year.

The report was accepted and the recommendation adopted.

Mr. Ransom proposed a vote of thanks to the committee for hitting just the right expression.

The motion was carried with much laughter.

Mr. Sard moved that the thanks of the Association be extended to the editor of *The Metal Worker* for the faithful reports of previous meetings which had appeared in that journal. Also that the thanks of the Association be extended to the secretary for his faithful labors during the year.

Adopted with enthusiasm.

Mr. Boynton: There is a matter of which I have been thinking for some time. I am in doubt whether it is better to say anything about it or not. That is the multiplication of patterns from one set. I may have one set in New York, my friend, Mr. Hill, may have a set in Peekskill. There may be another set in Philadelphia, and another in Rochester, in Buffalo, and so on through the country. This is all very well and proper, of course, under the existing circumstances, but is it not the ruin of our business, and is there no remedy for it?

The subject was not discussed.

Mr. Fuller moved a vote of thanks to the president, for the able manner in which he discharged his duties through the year. The vice-president put the motion, which was unanimously adopted by a rising vote.

Mr. Jewett responded as follows:

Gentlemen, I return you my sincere thanks for the complimentary notice which you have taken of my endeavors, and in conclusion I congratulate the convention on the large attendance at this important season of the year, for it really requires a great deal of fortitude and devotion to the Association to induce such gentlemen as Mr. Filley and Mr. Bradley, who live at such extreme points, to attend our meeting. It certainly speaks well for what the Association is endeavoring to accomplish. These gentlemen would not come here unless they thought a great good was being accomplished. I am satisfied that the sort of negative good with which this trade has been kept up for years since the organization of this Association has been of great influence. It is an influence that cannot be figured out, but it is such an influence that in my judgment amounts to a difference of a large sum of money to the manufacturers here. We know it creates a good feeling, and stimulates the whole trade. I congratulate you upon the harmonious feeling that has characterized our meeting, and the wise action which has prevailed. I wish you a safe and happy return to your families, and hope we may all have the pleasure of meeting again and again.

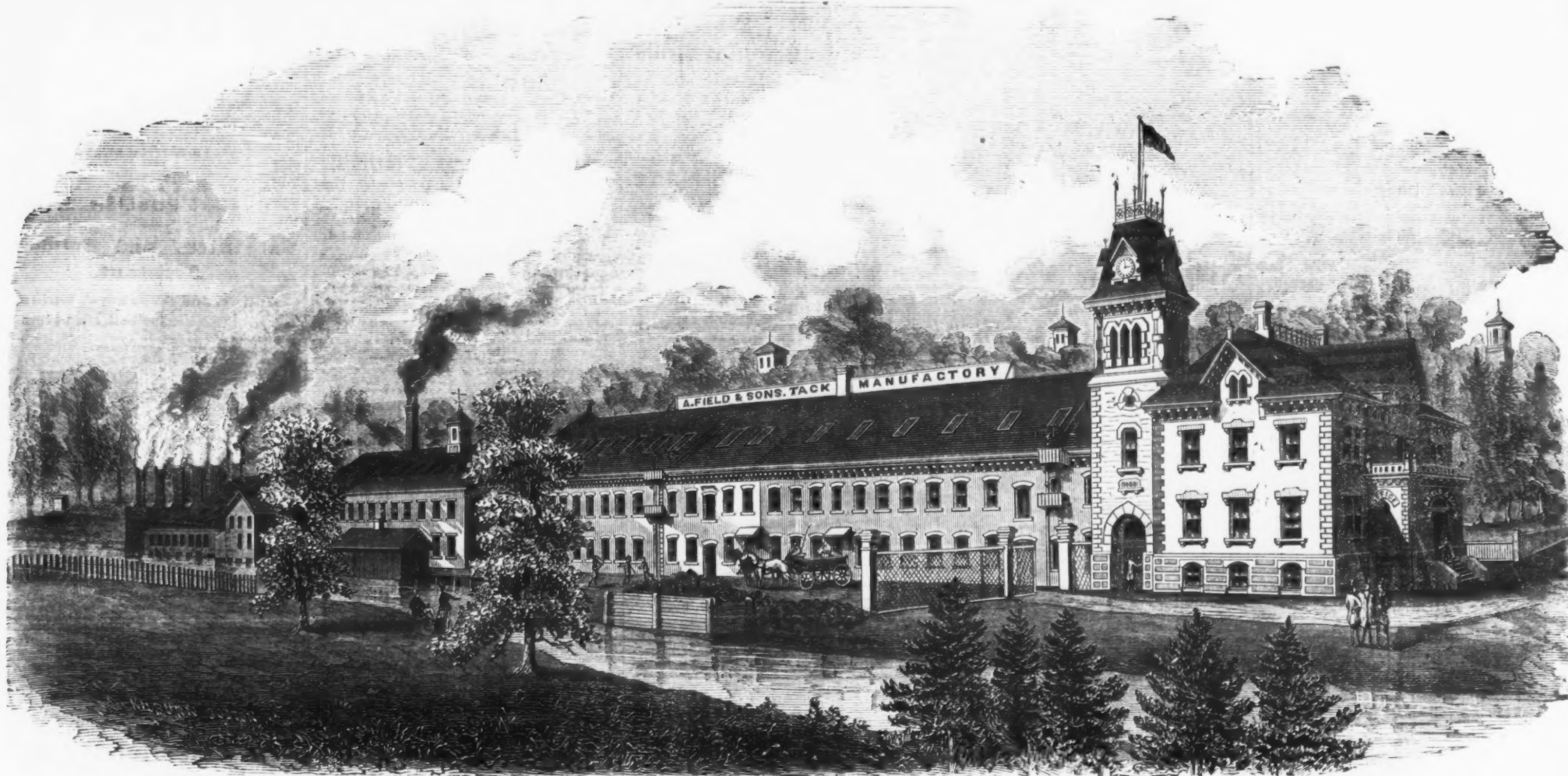
The Association then adjourned to meet in Detroit, Mich., on the second Wednesday in June, 1877.

THE BANQUET.

At 7 o'clock on Thursday evening the members and guests of the Association assembled at the Delavan House, Albany, and were elegantly entertained by the Albany founders at a banquet. With the popping of the champagne corks, the chairman of the evening, Gen. Rathbone, announced that anyone called upon must either make a speech, sing a song, or tell a story. All who were called upon responded without hesitation, and good speeches, good songs and good stories kept the tables in a roar until a late hour.

It is often necessary to surround the pipes of heating or evaporation apparatus, and hot air apparatus, ovens, stoves &c., with a liquid which will not boil at a temperature of 313° Fahrenheit; it is also often necessary to make use of baths which will not easily boil or freeze. The liquids usually employed for this purpose are water in which sea salt has been dissolved, oil baths, &c. Instead of these various agents, it is now proposed to make a solution of chloride of lime in glycerine, a solution which does not boil below 572° or 628° Fahrenheit, and has the further advantage of never attacking metals nor congealing.

ESTABLISHED 1827.



ENTIRE LENGTH OF WORKS 700 FEET.

A. FIELD & SONS

TAUNTON, MASS.

Manufacturers of

TACKS

NAILS

BRADS AND PATENT BRADS.

IRON
COPPER
TINNED
SWEDES IRON
UPHOLSTERERS'
CARD CLOTHING
PAIL AND TUB
GIMP
LACE
PATENT COPPER PLATED
LARGE HEAD CARPET

FINISHING
TRUNK
CLOUT
CHAIR
CIGAR BOX
HUNGARIAN
HOB
SILVERED OR JAPANNED LINING
SILVERED OR JAPANNED SADDLE
TUFTING
COPPER CUT

LEATHERED CARPET
TINNED CARPET
COLORED COATED CARPET
COFFIN LINING
MINERS'
BRUSH
LOOKING GLASS
SHOE OR LASTING
ROUND HEAD
ROOFING
EVERY STYLE OF

BOAT REGULAR
BOAT CHISEL POINTED
FINE TWO PENNY
FINE THREE PENNY
PATENT COPPER PLATED
CHANNEL
AMERICAN IRON SHOE
SWEDES IRON SHOE
ZINC SHOE
STEEL SHOE
CHARCOAL IRON SHOE

With New, Improved, and Patented Machinery. we shall now make

GLAZIERS' POINTS,

ONE OF OUR SPECIALTIES.

Any variation from the regular size or shape of the above named goods made from samples to order.

QUALITY GUARANTEED TO BE SATISFACTORY.

OFFICES AND FACTORIES. - - - - - TAUNTON, MASS.

Warehouse and Salesroom at 78 Chambers Street, New York.

Special Notices.

Office of
The Table Cutlery Manufacturers' Association,
Of the United States, comprising:
BEAVER FALLS CUTLERY CO.,
LANDER, FRARY & CLARK,
JOHN RUSSELL CUTLERY CO.,
MERIDEN CUTLERY CO.,
CHICAGO CUTLERY MFG. CO.,
LAMBSON & GOODNOW MFG. CO.

TO THE TRADE: With a view of reducing the excessive number of Patterns of Table Cutlery, the members of this Association will offer at Auction, through

Messrs. Bissell, Welles & Millet,
No. 15 Murray Street, New York, their entire stock of Discarded Patterns, which will include all goods not regularly classified and priced by the Association, to which the attention of buyers is solicited. All goods offered by us will be of "FINEST QUALITY."
By order of the Association,
P. N. OAKMAN, Jr.,
J. B. BEADLE,
C. S. LANDER,
Exec. Committee.
N. Y., January 17th, 1877.

GENTLEMEN: Referring to above Circular of the Cutlery Association, we hereby announce to the Trade that we shall offer at Auction, at our Sales-room, No. 15 Murray Street, on
Tuesday and Wednesday, Feb. 13th & 14th, at 10 o'clock a. m., for Cash,
over \$40,000 worth of first quality Table Cutlery, Carvers, Butcher Knives, &c., being the production of the above leading manufacturers, and comprising from \$500 to \$400 gross Table Cutlery, together with a large line of Carvers and Butcher Knives. This sale will be peremptory, and the entire quantity sold, as the patterns offered by us are to be withdrawn from the market. This sale will be made in lots to suit large and small buyers, and the well known character of the manufacturers is a guarantee of the quality of the goods. The variety of styles and patterns will be such as to meet the demands of the trade of all sections, and the sale will be in every respect worthy of your attendance.

Also, in addition to above, we will offer a large and attractive line of Pocket Cutlery, Razors, Scissors, Plated Spoons and Forks, &c., &c.
We would also notify the Trade that we will continue the sale on Thursday and Friday, Feb. 15th and 16th, when we will offer a large line of Heavy and Shear Hardware direct from manufacturers, particulars of which will be given in *The Iron Age* hereafter. Manufacturers who may desire to avail themselves of this opportunity will please forward their invoices early.

Catalogues will be ready on Tuesday, Feb. 6th.
BISSELL, WELLES & MILLET,
Auctioneers,
No. 15 Murray St., New York.

For Sale.

A No. 5 Geared Stiles & Parker Press. Perfect order. Quite new. Latest pattern.
B. D. WASHBURN & CO., Boston.

A PARTNER WANTED

In a well established Hardware house in Birmingham, Ala. A capital of \$3000 will secure an equal interest in a house established in this place in 1871. Applicant must come well indorsed for moral character and business habits.

Address **BOX 10,**
Office of *The Iron Age*, 10 Warren St., N. Y.

Wanted,

May 1st, by an Englishman, aged 36, for the past 10 years with a Sheffield Cutlery house, as their confidential clerk, a position in an American or English Hardware Firm. Present employers contemplate retirement from this market.

Address **P. O. BOX 5634.**

TEXAS.

Wanted, by a young man who has been engaged in the Hardware business in Texas, a position as traveling salesman for that State. Best references given. Address **HARDWARE,**
320 North 3d St., ST. LOUIS, MO.

7 or 10 Ton Hammer Wanted

of modern pattern, in good order. State price, maker, time used, and full description.

"STEAM HAMMER,"
Office of *The Iron Age*, 10 Warren St., N. Y.

Second-Hand & New Machine Tools.

One "Davy Bro's" 1200 lb. Steam Hammer. Three 21 inch swing "Pond" Drills. Three 4 Spindle Drills. One 5 ft. Radial Drill. One 2 Spindle Profiling Machine. Three Common Milling Machines. One No. 3 Smith & Garvin Milling Machine. One No. 4 Smith & Garvin Milling Machine. One Brown & Sharpe Universal Milling Machine. One Mason Milling Machine. One Crank Planer. One 2000 lb. Ferris & Miles Steam Hammer. Two 32 in. swing 15 ft. bed Lathe. One 30 in. swing 10 ft. bed Lathe. Four 30 in. swing 8 ft. bed Lathe. One 24x36x6 ft. Planer. One Die Sinking Machine. One 24x24x5 ft. Planer. One 21 in. swing 8 ft. bed Lathe. One 15 in. swing 6 ft. bed Lathe. One No. 4 Wood & Lichte & Co. Upright Drill. One Wood, Lichte & Co. combined Shaping and Slotting machine.

The above tools have been little used, will be sold very low and can be seen at the store of

GEORGE PLACE,
131 Chambers and 103 Reade Sts., N. Y.

\$10,000.

WANTED.—A Secretary and Treasurer with a capital of \$10,000 for an American Joint Stock Hardware company; must be duly qualified, willing to proceed to Melbourne, Australia, and reside there permanently. Address **HARDWARE,**
Office of *The Iron Age*, 10 Warren St., N. Y.

WATER POWER

FOR

Rent or Sale.

The Ousatonic Water Co.

Having still unoccupied

WATER POWER & MILL SITES,

Would invite Manufacturers and others wanting power to examine them, having the advantage of permanent and cheap power, and cheap freight, both by rail and water, and easy of access, being within 2 1/2 hours of New York. The location and facilities are unsurpassed. Address

"OUSATONIC WATER CO.,"
BIRMINGHAM 7, CONN.

Special Notices.

NOTICE.

The public are cautioned against constructing, selling or using any Screw Machinery employing the inventions or improvements described in the following Letters Patent of the United States:

Letters Patent No. 42,786, for improvements in machinery for nicking the heads of wood screws, granted to H. A. Harvey, May 17th, 1864.
Letters Patent No. 42,776, for improvement in machinery for cutting thread upon wood and other screws, granted to H. A. Harvey, May 17th, 1864.
AMERICAN SCREW CO.

I am prepared to make arrangements with Eastern manufacturers to act as their agent for the sale of Hardware, etc., on the Pacific Coast.

CHARLES OTTO,

(ESTABLISHED 1854.)

Importer & Dealer in **HARDWARE,**
Manufacturers' Agent, etc
312 Bush St., San Francisco.

REFERENCES:

Sargent & Co., 37 Chambers Street, New York.
Van Wagner & Williams, 83 Beekman St., N. Y.
F. Heesenbruch & Co., 10 N. 5th St., Philadelphia.
The Pennsylvania Tack Works, Norristown, Pa.
The Pacific Bank, San Francisco.

EXPORT TO RUSSIA.

We are established at St. Petersburg for the sale of American Machinery, Hardware, Agricultural Implements and technical products generally. We beg to solicit correspondence with manufacturers desirous of being represented in Russia. Familiar with the wants of the trade, and as Civil Engineers being brought in contact with the industrial interests, we are enabled to successfully introduce American products. We are also able to obtain at the lowest rates, patents for any American invention the sale of which is placed in our hands. Address all circulars and price lists to **HARTOCH BROS.,**
Galerna 56, Quart 1, St. Petersburg, Russia.
Any information desired will be furnished by our American correspondents.
Messrs. Pinelzer Bros. & Co.,
421 Market St., Philadelphia.

A. L. RISSE & CO.,

Importers of

HARDWARE,

Agricultural Implements,
TOOLS, &c.

Commission Merchants

AND

Manufacturers' Agents.

Tejadillo 17, Habana,

DOMINGUEZ 5, CERRO, HABANA.

Liberal advances on approved

consignments.

To Manufacturers of Goods Suitable for English Markets.—A firm of Commission Merchants in London, of long standing and experience in the export trade, is desirous of receiving, on commission or otherwise, representing American manufacturers of Tools, Machinery, Hardware, &c. First-class references given and required. Address, in first instance, **W. M. Carr of Geo. Morgan, Esq.,**
1614 Mt. Vernon St., Philadelphia.

American Manufactures in England.

A merchant of long experience in Birmingham England, will devote time to the sale of, and to the procuring of orders in the English market for American manufactures. For particulars apply to the
Office of *The Iron Age*, 10 Warren St., N. Y.

MANUFACTURERS

desirous of introducing their goods to the British and Continental Markets, are advised to insert advertisements in the newspaper "IRON," published every Saturday, at 99 Cannon Street, London, E. C.

TO PERSONS AT PRESENT ENGAGED IN A Traveling Commission Business among Hardware Dealers and Manufacturers, a good opportunity is offered to sell with their other goods an article of Hardware on commission which should be remunerative for the amount of labor expended.

Persons answering this advertisement will please write, giving references, to
P. O. Box 2279.

RESIDENT BUYER.—A gentleman of more than twelve years' experience in the general hardware business, and for several years past acting as buyer of the entire stock of one of our large Eastern wholesale houses, will make arrangements to act as buyer for a few Western or Southern correspondents. Thoroughly understands the requirements of both markets, and being constantly in communication with all Eastern manufacturers, offers his services in this behalf. Best of references furnished. Address **G. U. S.,**
P. O. Box 4743, New York City.

Special Notices.

TO LET,
A Light, Handsome Office.
Possession Immediately.
HERMANN BOKER & CO.,
101 Duane Street, N. Y.

MACHINERY,
New and Second-Hand.

ENGINES:
32x72 in. Corliss Beam, 14x36 in. Woodruff & Beach Hor., 12x31 Green Cut off, and six H. P. Haskings, all in perfect order. Prices low.
PLANERS:
60 in. x 12 ft., 42 in. x 18 ft., 24 in. x 6 ft., 22 in. x 5 ft. Lathes, Milling Machines, Drills and Presses.

ALLIS, BULLARD & CO. (Limited),
14 Dry Street, New York.

Agricultural Implements

for export and the trade; largest stock always on hand ready to ship at notice. Manufacturer of **COMMON SENSE STALK CUTTER,**
VICTOR CORN SHELLER, etc., etc.
A. B. COHU, 197 Water Street.
"Everything for the Farm," containing illustrations of 250 of most improved implements of Farm, sent on receipt of 10c.

NOTICE! POND'S TOOLS.

The undersigned has assumed the Personal Property, including accounts, finished and unfinished Machinery, good will &c., connected with the manufacture of **MACHINERY TOOLS** as conducted by Mr. Lucius W. Pond since 1847, and will continue the said business at the old stand, cor. Union and Exchange Sts., Worcester, Mass., under the name of **DAVID W. POND, Successor to Lucius W. Pond.**

CARD.—Having assumed the business mentioned above, I solicit Inquiry and Patronage, with guarantee that present standard of Workmanship and quality of Machinery shall be maintained. A large quantity of New and Second-Hand Tools, ALL STYLES AND SIZES, For Sale at Low Prices. Send for list of second-hand tools. Store at 98 Liberty St., New York, will be also issued from Feb. 1, 1876, and all sales made from manufactory.

Respectfully,
DAVID W. POND,
Successor to LUCIUS W. POND.

DISCOUNT LISTS.

Hinges (Stanley Works) list... 10¢ to 50¢ each. 15¢ and 20¢. 1/2 in. Mig. Co. list... 10¢ to 60¢. 7¢. Screws, Bolt, Fine Hinge and Bolt List.—Contains all the lists and discounts that are used. Price, \$1.00.
Dayton & Lamberson, 97 Chambers St., N. Y.

To Manufacturers, Hardware and Iron Merchants generally.

FOR SALE, on easy terms, a Machine Shop, Foundry and Boiler Shop, together with their entire equipment and supplies. The entire property will invoice about \$30,000, title perfect; or the entire may be exchanged for a wholesale stock of Hardware and Cutlery, or a general assortment of Iron and Nails, on fair terms. Location as good as any in the State. For particulars, address,
E. T. HAINES, Muncie, Ind.

Engagement Wanted.

A business man of large experience in manufacturing and trade, accustomed to the management of men and works, desires an engagement in any branch of business or industry. References of the most satisfactory character given.

Address **J. E. G.,**
Office of *The Iron Age*, 10 Warren St., N. Y.

CONSUMES THE BLACK SMOKE.

Saves Coal, Saves Waste of Iron, and Consequently Saves Money.

Gilmore's Improved Double Grate Reverberatory Furnace

For Puddling, Rolling, Boshelling or Reheating Iron. Its thorough efficiency apparent on examination, and two years' practical test proves it will do all that is claimed for it. Admits of little to first cost, or may be applied to old furnaces, and any furnaceman can work it without special instruction.

No prudent forge or mill management can afford to be without it.

Royalty, \$100 for each furnace per annum, or one-tenth of actual savings, as may be preferred by the user. Address

H. H. GILMORE, Patentee,
Supt. Boston Rolling Mills,
Cambridgeport, Mass.

Situation Wanted.

An experienced Bookkeeper, who has been employed for the last six years in one of the largest Jobbing Hardware Houses in Central New York, desires a situation. Is married, and not afraid to work. Would locate anywhere, if salary were satisfactory. First class references furnished.

Address **G. B.,**
Office of *The Iron Age*, 10 Warren St., N. Y.

Situation Wanted

as Bookkeeper, Salesman or Traveling Agent, by a man who has been in Hardware Jobbing and Retail Trade in above capacities, for sixteen years.

Address **HENRY LUDWIG,**
75 Lake St., Chicago, Ill.

For Sale.

A Well Established Hardware Business, of twelve years' standing, in a thriving town of 3500 inhabitants, in Central Pennsylvania.

Address **D. C.,**
Office of *The Iron Age*, 10 Warren St., N. Y.

Machine Shop Foreman.

Wanted, a practical machinist, with experience in the best methods of doing work and employing men, and also having general mechanical knowledge, to act as foreman in a large machine shop doing general work. The best of references required.

Address, with terms and references, **A. B.,**
Office of *The Iron Age*, No. 10 Warren St., N. Y.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address,
IRON AND STEEL,
Care of P. O. Box 813, Bridgeport, Conn.

Special Notices.

Steel Castings.

Solid and Homogeneous. Guaranteed tensile strength, 25 tons to square inch. An invaluable substitute for expensive forgings, or for cast iron requiring great strength. Send for circular and price list to
CHESTER STEEL CASTINGS CO.,
Evelina St., Philadelphia, Pa.

SPECIAL NOTICE

A new style of
MEN'S SINGLE GUNS,
In addition to the former line of A. Simon's, Liege, now offered.

SILESIAN SHEET ZINC,
Imported by
LOUIS WINDMULLER & ROELKER,
20 Reade Street, N. Y.

A SPECIAL MACHINIST AND EXPERT DESIRES a position to reorganize any manufacturing business, or to start new. Can do small drilling or tapping for 10 cents per M; use steam-power for bench molding, and reduce labor costs generally; is thoroughly acquainted with every detail of machinery and hardware business in their most advanced forms. Can furnish information of new machines for which there is a present demand, also, new designs, or can assist anyone unreasonably taxed by patents. For reference, address
E. G. DODD,
Greenpoint, L. I.

A. PURVES & SON,

Corner South & Penn Streets, Phila.,
Dealers in
Scrap Iron & Metals, Machinery, Tools,
Shafting & Pulleys, Steam Engines,
Pumps & Rollers, Copper, Brass,
Tin, Habbit Metals, Foundry
Facing. Best Quality Pigot Brass.
Cash paid for all kinds of Metals and Tools.

DROP FORGINGS.

The TRENTON VIEW & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings
in quantities to order at reasonable rates.

HERMANN BOKER & CO. Proprietors,
101 & 103 Duane St., N. Y.

Ramsey's Car Truck
Shifting Apparatus.

The advantages gained by using Ramsey's Car Truck Shifting Apparatus, are as follows:

1st.—The power required to run a car in the level track is sufficient to separate the trucks from a car body.

2d.—It avoids twisting or straining the car frames.
3d.—The manufacturing cost of this Shifting Apparatus will not exceed one hundred dollars. And each one is capable of doing more work with less strain to the car, and without the assistance of an extra Steam Engine, than a Steam Hoist, costing twelve thousand dollars.

At each one of the principal stations where car wheels are regularly tested to see how they stand the journey, a switch is placed, having a depression or pit about eighteen inches deep, with gentle inclines at each end, and on each side a narrow track, remaining on the level, upon which is small but strong trucks, designed to carry supporting beams or cross-bars extending from one to the other across the pit, for the purpose of bearing the car body, while the trucks run down the incline rails to the pit.

A Working Model of this Apparatus is on exhibition at

220 S. Fourth Street, Philadelphia, Pa.

Communications may be addressed to

RAMSEY & SCARLETT, as above, or to

Box 162, Cobourg, Ontario, Canada.

See *The Iron Age* of Sept. 7, 1876.

Briesen's Patent Agency

FOR SECURING INVENTIONS, TRADE MARKS, &c., IN AMERICA AND EUROPE.

No. 258 Broadway, New York.

A. V. BRIESE.

Wanted—A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy.

A practical man who is already well established.

Address **CAR WHEEL FOUNDRY,**
P. O. Box 134, Selma, Alabama.

SPECIAL NOTICE.

I have three patents for Dies, Machinery and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1855; January 31, 1856; and July 3, 1856. There is a special claim on each of the dies. All persons infringing on said patents will be held responsible to the extent of the law. **Russell Jennings,**
DEAR RIVER, Conn., Sept. 7, 1874.

Wanted, Light T Rail.

Parties having for sale 50 to 100 tons of slightly worn, 25 to 35 lbs. T. Rail, can find a purchaser at a reasonable price, by addressing (with price delivered in New York or Philadelphia.)

D. G. AMBLER, Utica, N. Y.

W. & A. C. SEMPLE,

(Manufacturers' Agents.)

RAILWAY SUPPLIES METALS, &c.

44 Third St., LOUISVILLE, KY.

We solicit the business of manufacturers who are desirous of being represented in this market.

New York, Jan. 31, 1877.

POCKET CUTLERY.

An experienced traveler, well acquainted with the dealers in Cutlery and Hardware in the Western States, would like to connect another agency by which to reduce his traveling expenses

Address **H. H.,**
Office of *The Iron Age*, No. 10 Warren St.

A YOUNG MAN (31 YEARS) IN A HARDWARE Jobbing House going out of the business, desires a position in a Western or city house. Best of reference given. Address **J. R. B.,**
Office of *The Iron Age*, 10 Warren St., N. Y.

WANTED.—A situation by a man 30 years of age, who is competent to manage the accounts and finances of a concern, or to take charge of the manufacturing department. Has had large experience in managing men, especially in a foundry. Address **P. A. H., Box 3341, New York.**

Special Notices.

BOOKS.

Any of the following Books will be sent, postpaid, upon receipt of price, by

DAVID WILLIAMS,

10 Warren St., New York.

JUST PUBLISHED.

Carpenters' and Builders' Assistant,

And Wood Workers' Guide.

By L. D. GOULD, Architect and Practical Builder. Containing 23 plates, fully described, including valuable tables and rules, as follows: An article of Construction of Roofs and Roof Coverings; Practical Method of Finding the Number of Cubic Feet and Inches contained in Timber and other Materials; Weight or Force Required to Tear Asunder one square inch of the Different Materials used in the Construction of Buildings, also Weight Required to Crush the Same; Adhesion of Glue, Nails, Screws and Iron Pins; Terms in Carpentry, &c., &c. This work is intended to combine all the knowledge the workman requires to construct any design in carpentry, by a new and easy system of lines, reducing the science of construction to an agreeable and pleasant occupation, rather than an unpleasant task. One octavo volume, bound in cloth, price, \$3.

Draining for Profit and

Draining for Health.

BY GEORGE E. WARING, JR., Engineer of the Drainage of Central Park, New York.

With Nearly Fifty Illustrations.

CONTENTS: Land to be Drained; How Drains Act; How to Make Drains; How to take Care of Drains; What Drains will do; Will it Pay? How to Make Tiles; Reclaiming Salt Marshes; House and Town Drainage. Price \$1.50.

JULES VERNE'S LATEST & BEST.

MICHAEL STROGOFF:

The Courier of the Czar.

BY JULES VERNE.

Authorized Edition from Original Plates.

With all the Original Illustrations Engraved Expressly for this Work,

after Designs by Ferat.

One volume crown 8vo, extra cloth, beveled edges, and richly stamped in black and gilt, with 90 full-page engravings on wood. Superbly printed on calendered paper. Price \$3.

There are few countries which are so full of interest to Americans as is Russia. In laying the scene of his latest story in that great empire, Jules Verne seems to have aimed to gratify his readers in this country. A revolt in some of the remote provinces makes it necessary for the Czar to communicate with his brother, the Grand Duke, at Irkutsk. Michael Strogoff, one of the corps of the couriers of the Czar, is selected for the dangerous service. His marvelous coolness, prudence and courage are constantly and thoroughly tested in the course of his perilous journey, but at last he falls into the hands of the insurgents. The story of his thrilling adventures is related with such vivid power as to make it seem like an actual narrative, while the descriptions of the country, of the people and of their customs, are evidently the result of actual study and close observation.

* * * This volume contains also a brilliant story of Mexican life by Jules Verne, entitled "The Multi-neers," richly illustrated.

LIST OF RECENT PUBLICATIONS.

Hours of Thought on Sacred Things. By James Martineau. 1 50
Our National Centennial Jubilee Orations. Edited by Fred. D. Howland. 3 50
Book of the Chronicle. Titled "The Chronicle of Homilectically Explained by Dr. Otto Zuchner. 5 00
The Duchess of Rosemary Lane. By Farjeon. 75
The Shadow of the Sword. By Robert Buchanan. 1

Trade Report.

Office of THE IRON AGE.
WEDNESDAY EVENING, Jan. 31, 1877.

During the past week there has been a decidedly good feeling in Wall street. The events of greatest general interest have been the Treasury call for \$10,000,000 more of 5-20 six per cent. bonds, the decline of gold and the further heavy decline in coal shares. The local money market has been easy, with rates to borrowers on call at 4 per cent., and on prime business paper 4½ @ 6 per cent.

The decline in gold to 105½, the lowest price since June 13, 1863, resulted in part from the calling in of bonds, and in part from the semi-official utterances of President Grant to the effect that the remaining \$230,000,000 4½ per cent. bonds will be issued as rapidly as they can be handled by the Treasury clerks, and that specie payments can and will be brought about by the first of the coming March. It is probable that the President was not correctly reported in this last statement, for it is preposterous to suppose that the Treasury, which now has about \$30,000,000 of gold available for resumption, and which should have at least \$100,000,000 so available, can begin resumption on March first; particularly as it is impossible to get \$70,000,000 gold into the Treasury within the next 30 days.

The fluctuations in the gold premium since our last report are shown in the following table:

	Highest.	Lowest.
Thursday.....	105½	105½
Friday.....	105½	105½
Saturday.....	105½	105½
Sunday.....	105½	105½
Tuesday.....	105½	105½
Wednesday.....	105½	105½

Government bonds have been firm, but have been unable to resist the steady decline in gold. The call of \$10,000,000 bonds is confined to the bonds known as 01165, and after it is satisfied about \$80,000,000 of this class of bonds will remain outstanding. The call was made at the request of the Syndicate, which body, it is assumed, have a market for \$10,000,000 more 4½ per cent. bonds; this makes \$17,000,000 of 5-20s called in at their request. The call is the thirty-eighth issued by the Treasury.

The stock market has been alternately strong and weak, but prices have manifested a decided tendency to follow the lead of the coal stocks. The decline in the coal stocks and bonds was started by the fall in coal, which at the auction sales during the week touched lower prices than were made last summer after the breaking up of the combination. This decline in the price of coal weakened all coal securities, and was construed as imperiling the very existence of the companies most embarrassed, to wit: the New Jersey Central and the Philadelphia Reading.

The principal dealings of the operators have been in the stocks which usually display the greatest speculative activity.

The following is a comparison of the averages of the New York banks for the past two weeks:

	Jan. 30.	Jan. 27.	Differences.
Loans.....	\$252,411,900	\$253,156,100	Inc. \$744,300
Specie.....	40,974,900	40,187,000	Dec. 787,900
Legal tenders.....	40,128,800	42,251,300	Inc. 2,122,500
Deposits.....	227,342,800	230,625,000	Inc. 3,282,200
Circulation.....	15,491,900	15,495,900	Inc. 4,000

The movements in foreign trade for the week are shown in the following tables:

IMPORTS.			
For the week ended Jan. 30:			
	1875.	1876.	1877.
Total for week.....	\$6,706,933	\$5,098,296	\$5,541,161
Prev. reported.....	19,087,884	24,294,115	17,441,061
Since Jan. 1.....	\$25,838,137	\$27,700,984	\$23,082,492

Among the imports of general merchandise were articles valued as follows:

	Quant.	Value.
Brass goods.....	3	3,225
Bronzes.....	7	2,668
Chains and Anchors.....	43	2,638
Copper.....	172	1,172
Cutlery.....	59	18,597
Guns.....	5	2,540
Iron, pig, tons.....	88	2,739
Iron cotton ties.....	182	1,328
Iron ore, tons.....	510	1,004
Iron, other, tons.....	46	583
Metal goods.....	88	10,997
Needles.....	13	3,456
Nickel.....	1	290
Old metal.....	196	1,196
Plated ware.....	3	3,383
Steel.....	11	293
Silverware.....	3	201
Tin, boxes.....	13,436	80,769
Tin, 1,550 slabs.....	80,339	13,938
Wine.....	1	508

EXPORTS EXCLUSIVE OF SPECIE.

For the week ended Jan. 30:			
	1875.	1876.	1877.
Total for week.....	\$5,579,073	\$5,098,296	\$5,535,160
Previously reported.....	16,744,402	19,902,541	23,813,502
Since Jan. 1.....	\$22,423,475	\$25,000,987	\$29,348,662

EXPORTS OF SPECIE.

For the week ended Jan. 27:			
	1875.	1876.	1877.
Total for week.....	\$212,863	\$212,863	\$212,863
Previously reported.....	758,628	758,628	758,628
Total since Jan. 1, 1877.....	\$971,491	\$971,491	\$971,491
Same time in 1876.....	1,966,000	1,966,000	1,966,000
Same time in 1875.....	2,347,543	2,347,543	2,347,543
Same time in 1873.....	6,570,892	6,570,892	6,570,892
Same time in 1872.....	1,495,321	1,495,321	1,495,321

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6s.....	123	123½
U. S. 6s 1861, reg.....	113½	114
U. S. 6s 1861, cou.....	113½	114
U. S. 6s 1865, reg.....	108	108½
U. S. 6s 1865, cou.....	108	108½
U. S. 6s 1865, new reg.....	110	110½
U. S. 6s 1865, cou.....	109½	110
U. S. 6s 1867, reg.....	112½	113
U. S. 6s 1867, cou.....	112½	113
U. S. 6s 1868, reg.....	116	116½
U. S. 6s 1868, cou.....	116	116½
U. S. 10-40 reg.....	113½	114
U. S. 10-40 cou.....	113½	114
U. S. 5s 1861, reg.....	110½	111
U. S. 5s 1861, cou.....	110½	111
U. S. 4½s 1861, reg.....	106½	107

The following are the closing quotations of active stocks:

	Bid.	Asked.
Atlantic and Pacific Telegraph.....	15½	16
Chicago & Northwestern.....	35	35½
Chicago & North Western.....	35	35½
Chicago, Rock Island and Pacific.....	101½	102
Chic. & N. W. & Quincy.....	117½	118
Col. Chic. & Ind. Cent.....	92½	93
Cleveland and Pittsburgh.....	92½	93
Chicago & Alton.....	101½	102
Preferred.....	110½	111
Canton.....	25	25½
Del. Lack. and Western.....	69½	70
Delaware & Hudson Canal.....	61	61½
Adams Express.....	104	104½
American Express.....	47	47½
United States Express.....	49½	50
Wells, Fargo & Co. Express.....	84	85
Eric.....	140	141
Harlem.....	140	141
Hannibal & St. Joseph.....	12½	13
Preferred.....	25½	26
Illinois Central.....	51½	52
Kansas Pacific.....	51½	52
Lake Shore.....	51½	52
Michigan Central.....	47½	48
Morris & Essex.....	89½	90
Milwaukee & St. Paul.....	18½	19
Preferred.....	51½	52
Mariposa.....	51½	52
Preferred.....	51½	52
New York Central.....	101½	102
New Jersey Central.....	25	25½
Ohio & Mississippi.....	61	61½
Pacific Mail.....	24½	25
Quicksilver.....	14½	15
Preferred.....	21	21½
St. L. Kan. City Northern.....	25½	26
Preferred.....	21	21½
Tol. Wabash & Western.....	6	6½
Union Pacific.....	61½	62
Western Union Telegraph.....	75½	76

GENERAL HARDWARE.

There is a decided improvement in the tone of the market this week, and we hear of considerable inquiry regarding prices. Few of the larger buyers from the West and South have visited our market, but in their absence a good deal of business by letter and from commercial travelers is being received. Altogether the feeling in the trade is of a much more hopeful nature than at our last writing, and while few are so sanguine as to expect a large business during the spring months, many who are in a position to feel the pulse of the trade believe that, notwithstanding the disturbing influences which have been at work, the coming season will witness considerable commercial activity. The changes in lists and discounts which have occurred during the week are few, and will be found below.

The demand for Nails is light, and the price remains as previously quoted, viz., 10d. to 60d., \$3, net, with the usual discount for lots of 100 kegs and over. Morris Wheeler & Co. quote their Chisel Pointed Nails, Pottstown brand, at 25 cents per keg advance on the above prices.

In Foreign Hardware no changes in prices are announced. The following extract from a letter from Geo. Wostenholm & Son, Limited, to their agent in New York, Asline Ward, under date of 13th ult., points to an advance in Buffalo and Stag Handled Cutlery at an early date: "At the sales last week Stag Horn went up 15 per cent. and black Buffalo 25 per cent. We shall consequently soon have to pay more, and have already had notice of an advance in black Buffalo, to come into force at once. The large horns are bought up by Germans for ladies' corsets, being much cheaper than whalebone. Good Stag Horn is very scarce."

King, Briggs & Co. have removed from their old quarters in Chambers street, to the large store No. 596 Broadway, two doors above the Metropolitan Hotel. In addition to their Hardware and Cutlery importing business they intend doing an export business. Their new store is 200 feet deep, and is conveniently located for country merchants visiting this market.

We invite the attention of the trade to the advertisement of P. & F. Corbin on the 26th and 27th pages. They illustrate a handsome line of Locks and Latches, which they are making with brass-plated fronts and bolts. They inform us that they were the first to successfully manufacture and introduce this class of goods to the trade. The great difficulty in plating iron with brass has been to secure a uniform shade of color. In this they state they have succeeded, and are prepared to furnish from stock Locks and Latches with a uniform coating of brass, presenting all the appearance of the solid metal. The list for these goods will be found in their advertisement, and is subject to the same discount as corresponding Locks with regular finish. It is also worthy of notice that they offer to furnish to order the same styles of goods with nickel-plated fronts, bolts, &c., at the same price as the brass-plated goods.

Leonard Bailey & Co., Hartford, Conn., have issued the following revised price list for their "Victor" Planes, etc., under date of January 1st. They say:

We present you with a revised and condensed price list of "Victor" Planes. In reducing the price to meet the times, we will continue to keep the standard of our goods at the highest point of perfection already attained; nothing but the very best materials and skilled labor will be used in their manufacture. Our facilities for the production of Iron Planes are unequalled. Our machinery is new and ingenious, and especially adapted to the business.

The "Victor" Planes are the product of 22 years' experience in manufacturing, improving and inventing Iron Planes. Each and every tool bearing the stamp and trade-mark of L. Bailey & Co. can be strictly relied upon for their superiority, and warranted perfect in all their parts.

Sargent & Co. are agents for these goods. The discount remains as before, and will be found under "New York Wholesale Prices," in another column:

Each.		Each.		Each.	
No. 0.....	\$0.70	No. 2½.....	\$2.20	No. 6.....	\$5.50
No. 0½.....	1.00	No. 2¾.....	2.25	No. 6½.....	6.00
No. 00.....	1.25	No. 3.....	3.20	No. 7.....	6.50
No. 000.....	1.50	No. 3½.....	4.00	No. 7½.....	7.00
No. 1.....	1.50	No. 4.....	4.00	No. 8.....	7.50
No. 1½.....	1.75	No. 4½.....	4.50	No. 8½.....	8.00
No. 2.....	1.75	No. 5.....	4.50	No. 9.....	8.50
No. 2½.....	2.00	No. 5½.....	5.00	No. 9½.....	9.00
No. 1¾.....	1.75	No. 10.....	4.00	No. 10.....	4.00
No. 1¾.....	2.00	No. 10½.....	5.50		

Plane Irons.

Sing'e.			
Inches.....1½	2	2½	2¾
Each cent.	2	4	4

NATIONAL Horse Nail Co.

MANUFACTURERS OF

FINISHED

[BRIGHT OR BLUED]



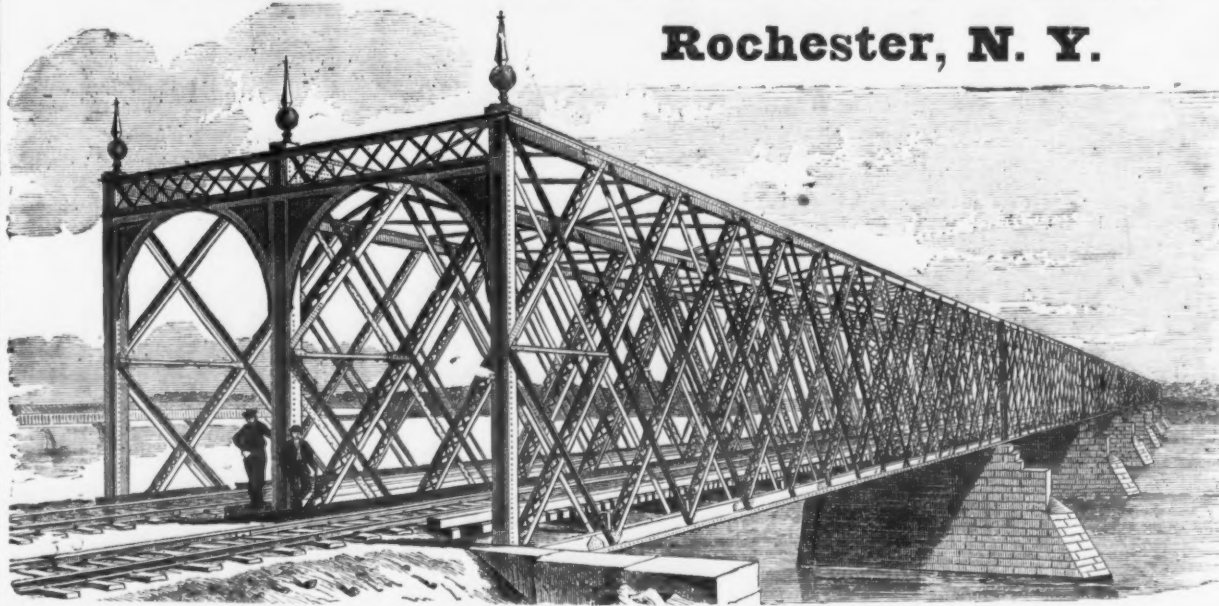
These nails are made of the best brands of **NORWAY IRON**, and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,
VERGENNES, VT.

HORACE DURRIE & CO., Agents,
No. 97 Chambers St., New York.

LEIGHTON BRIDGE AND IRON WORKS,

Rochester, N. Y.



Wrought Iron Riveted
Lattice Railroad

AND

• HIGHWAY BRIDGES.

Wrought Iron

WATER PIPE.

The most economical and durable Pipe manufactured for Water Works, Oil Lines or Gas Mains.

General Riveted Work

Orders Solicited from Civil Engineers and Contractors.

[Accompanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

L. COES'

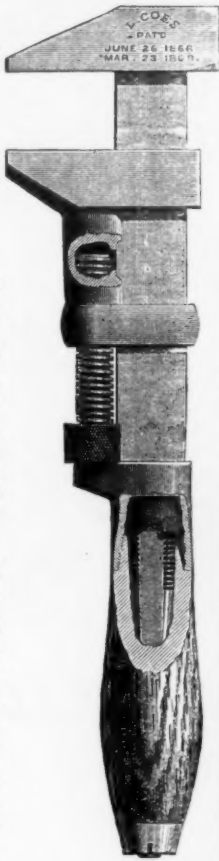
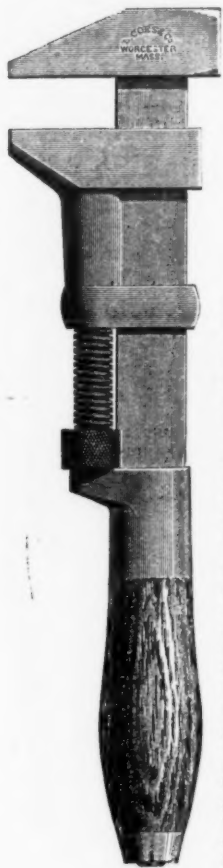
Genuine Improved Patent

SCREW WRENCHES.

Manufactured by

L. COES & CO.,

Worcester, Mass.



We invite the particular attention of the trade to our New Straight Bar Wrench, widened, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to any strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the fact, that in 1869 we made several important improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were at once closely imitated and sold as the Genuine Wrench by certain parties who seem to rely upon our improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be good evidence that we manufacture a superior Wrench, we wish the trade may not be deceived on the question of originality. Trusting the trade will fully appreciate our recent efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

"L. COES & CO."

Warehouse, 97 Chambers St., & 81 Reade Sts., N. Y.
HORACE DURRIE & CO., Sole Agents.

M.H. JONES & CO.
BEST OF STEEL AXES
AND EDGE TOOLS
Horace Durrie & Co. Agents, New York.

WILSON MANUFACTURING COMPANY.,

NEW LONDON, CONN.

SOLID BOX VISES.

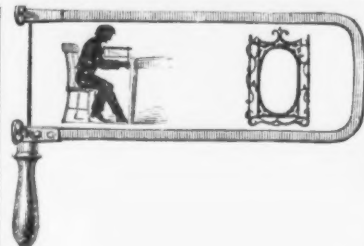
With or without Convex and Concave Washers.

Jackscrews, Braces, Coffee Mills, Turning Lathes; Clamp Heads and Screws; Parallel Bench Vises, Sash Pullies, Hot House Pullies, Composition Cocks, Bench Screws, Vise Screws, Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and General Hardware.

GALVANIZING DONE TO ORDER.

WILSON MFG. COMPANY,

Warehouse, 97 Chambers and 81 Reade Streets, N. Y.



We wish to inform Hardware Dealers throughout the country that we are putting up for the Christmas trade, in neat paper boxes, the following articles:

One Highly Polished Spring Steel Bracket Saw Frame, with patent indestructible Clamps.

Six Saw Blades.

Fifty Designs, embracing a great variety of fancy and useful articles.

One Sheet of Impression paper, and

One Brad Awl.

With full directions for using the Saw.

List price, per Box, \$1.25.

We have advertised these goods thoroughly throughout the country, and notified all interested persons that they could buy of the dealers at our regular rates. The demand for these tools is rapidly increasing, and some of them are in use in almost every town. They will sell in every hardware store where shown.

Millers Falls Company

74 Chambers Street, NEW YORK,

Corner of Broadway.

HOWARD PARALLEL BENCH VISE.

MANUFACTURED BY

Howard Iron Works,

Send for price list. Buffalo, N. Y.

RUSSELL & ERWIN MFG. CO. New York & PHILADELPHIA AGENTS.

THE EAGLE ANVIL

!! WARRANTED !!



(ESTABLISHED) 1843.

These Anvils are superior to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern), and from the quality of the materials employed.

The best English Anvils become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvil is of crystallized iron, and no settling can ever occur; the steel face, therefore, remains perfectly true. Also, it has the great advantage that being of a more solid material, and consequently with less rebound, the piece forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as of a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a hammer one fifth lighter than that required when using a wrought iron anvil.

The working surface is in one piece of JESSEP'S BEST TOOL CAST STEEL, which, being accurately ground, is hardened and given the proper temper for the heaviest work. The horn is covered with and its extremity made entirely of steel. The body of the Anvil is of the strongest grade of American iron, to which the cast steel face is warranted to be thoroughly welded and not to come off.

Price List, October 1st, 1876. ANVILS weighing 100 lbs. to 500 lbs., 75¢ per lb.

Smaller Anvils, ("Minims.")

No. 0 1 2 3 4 5 6 7 8 9

Weighing about 5 lb. 10 lb. 15 lb. 20 lb. 30 lb. 40 lb. 50 lb. 60 lb. 70 lb. 80 lb. 90 lb.

\$2.25 \$2.75 \$3.25 \$4.00 \$4.50 \$5.25 \$6.00 \$6.50 \$7.25 \$8.00 \$9.00

N.B.—These are the RETAIL PRICES. The only additional cost will be the freight to the purchaser's place of residence.

THESE GOODS ARE SOLD BY THE GENERAL AGENTS (with special discounts to the trades.)
New York.—Messrs. J. CLARK WILSON & CO.—RUSSELL & ERWIN MFG. CO.—Messrs. HORACE DURRIE & CO. Boston.—Messrs. GEORGE H. GRAY & DANFORTH. Philadelphia.—Messrs. JAMES C. HAND & CO. Baltimore.—Mr. W. H. COLE. Louisville.—Messrs. W. B. BELKNAP & CO. **FISHER & NORRIS, Sole Manufacturers, Trenton, N. J.**

THE VICTOR PLANES

Are the most simple, compact and practical Adjustable Planes ever offered to the public. They are made under the personal supervision of Mr. L. BAILEY, the original inventor of L. BAILEY'S PATENT ADJUSTABLE IRON PLANES. All our Planes have our Trade Mark. Send for Catalogue, embracing Planes, Try Squares, Bevels, Rules, Levels, Hammers, Mitre Boxes, etc., etc.

LEONARD BAILEY & CO.
PATENT ADJUSTABLE BENCH PLANES
CUSHMAN STREET, HARTFORD, CONN.

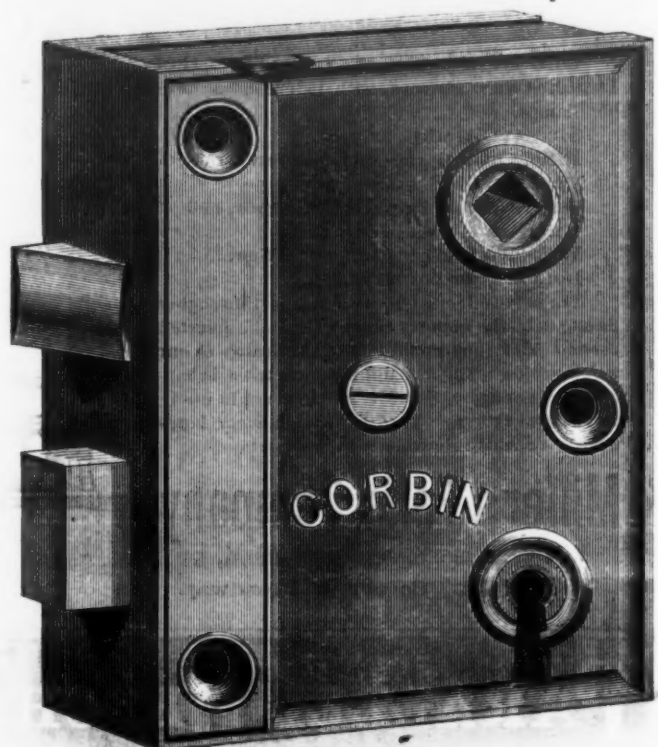
P. & F. CORBIN,

MANUFACTURERS OF

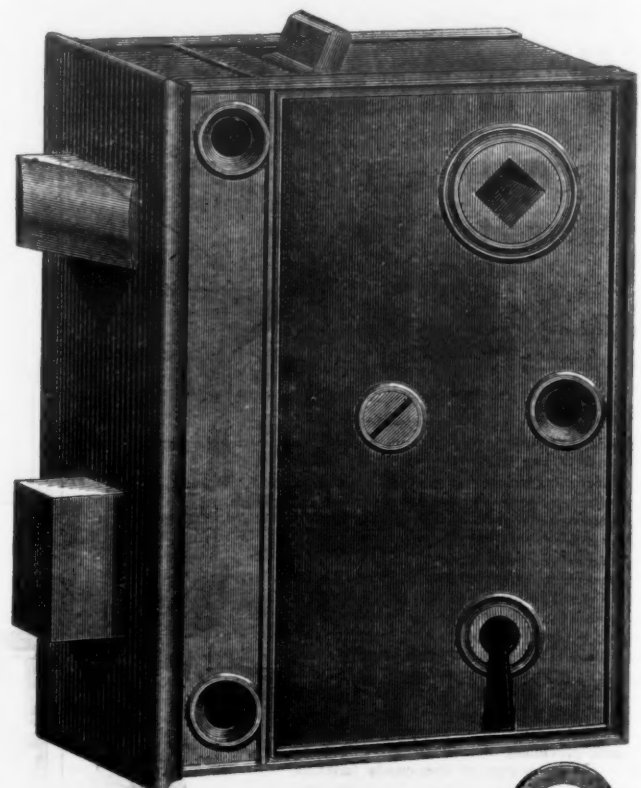
BUILDERS' AND MISCELLANEOUS HARDWARE.

Factories, NEW BRITAIN, CONNECTICUT, U. S. A.

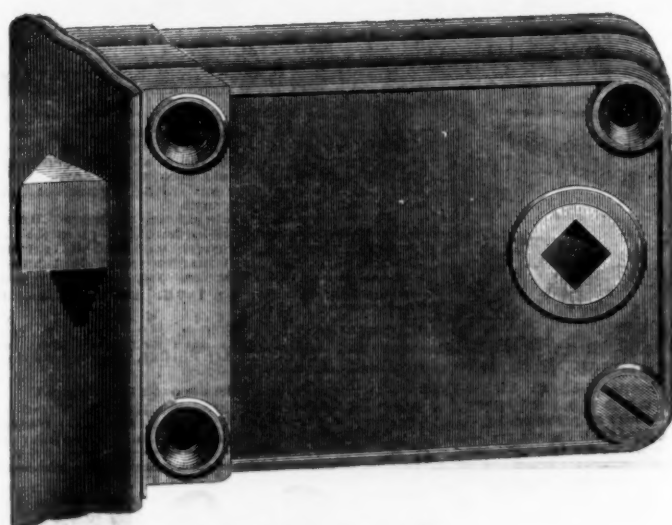
Warehouses, NEW YORK, Nos. 87 CHAMBERS and 69 READE STREETS.



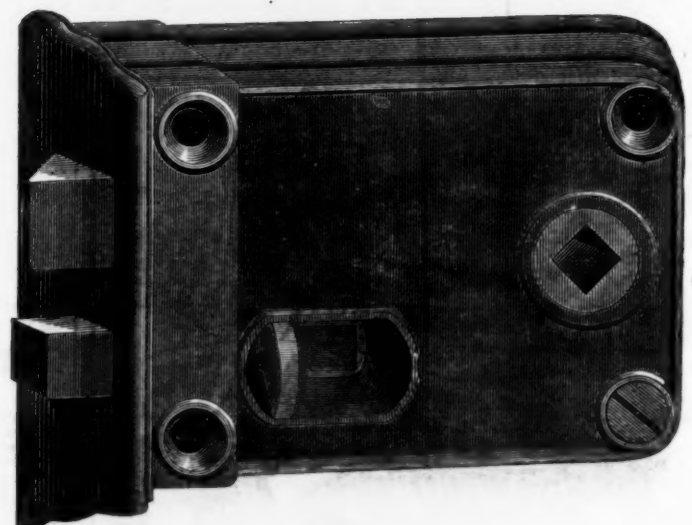
No. 465 1-2 B.



No. 962 B.



No. 301 1-2 B.



No. 302 B.

RIM KNOB LOCKS AND LATCHES.

WITH

BRASS-PLATED or NICKEL-PLATED BOLTS, SOLID BRASS KEYS.

SEE LIST NEXT PAGE.

P. & F. CORBIN,

CONTINUED.

MORTISE KNOB LOCKS AND LATCHES,

WITH

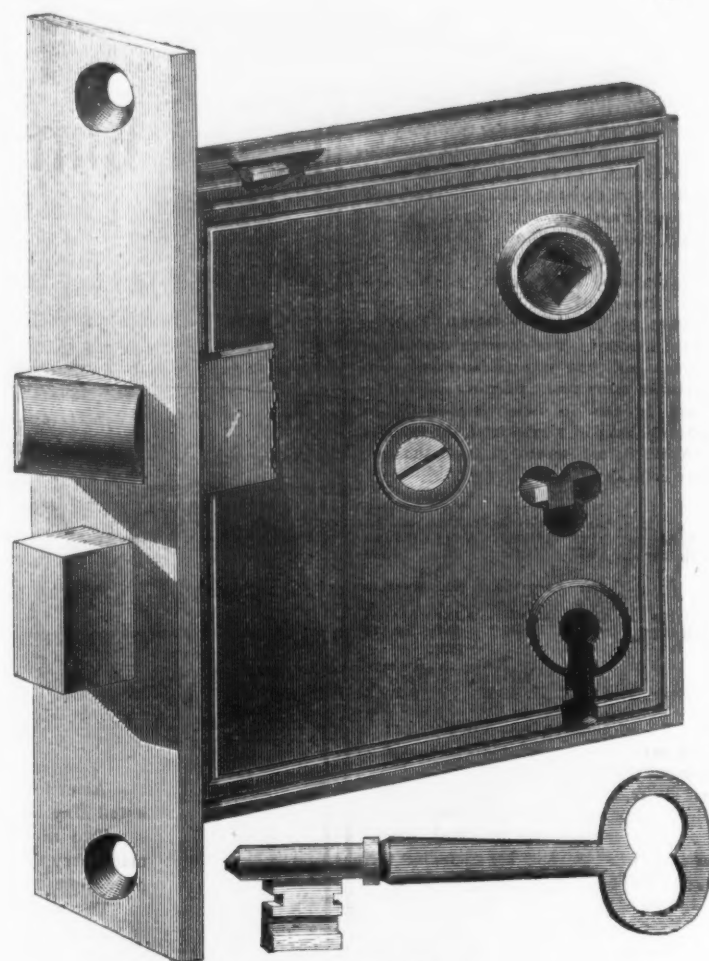
BRASS-PLATED

OR

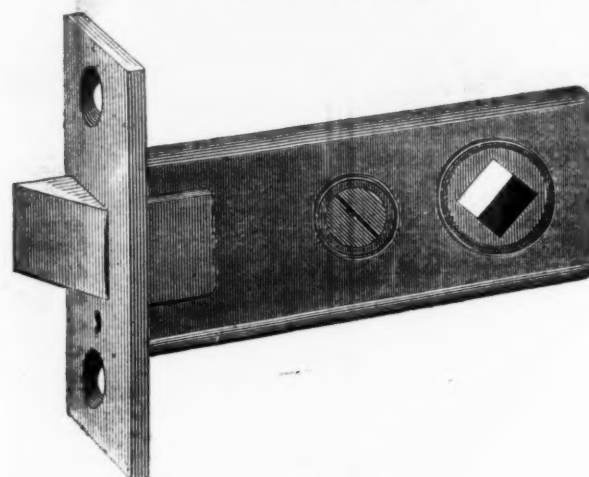
NICKEL-PLATED

FRONTS AND BOLTS.

Solid Brass Keys.



No. 1171, B B.



No. O. B B.

JANUS FACE UPRIGHT RIM KNOB LOCKS.

No.	Size.	Description.	Without Knobs, Per Dozen.
465 $\frac{1}{2}$ B.	4 inch.	Patent Reversible Latch, 2 Brass-Plated Bolts, Solid Brass Key	\$5.00
962 B.	4 inch.	Reversible Latch (cap off reverse), with Stop, 2 Brass-Plated Bolts, Solid Brass Key	5.25

HORIZONTAL RIM KNOB LATCH.

No.	Size.	Description.	Without Knobs, Per Dozen.
301 $\frac{1}{2}$ B.	3 inch.	Brass-Plated Bolt	\$4.00
302 B.	3 inch.	Brass-Plated Bolts with Slide Bolt	5.00

Above furnished with **NICKEL-PLATED BOLTS**, to order, at same list.

MORTISE KNOB LOCKS.

No.	Size.	Description.	Without Knobs, Per Dozen.
1171 B B.	3 $\frac{1}{4}$ inch.	Patent Reversible Latch, Brass-Plated, Front Strike and Bolts, Solid Brass Key.	\$5.75
1191 B B.	4 inch.	Patent Reversible Latch, Brass-Plated, Front Strike and Bolts, Solid Brass Key.	6.50

MORTISE KNOB LATCH.

No.	Size.	Description.	Without Knobs, Per Dozen.
O B B.	3 $\frac{1}{4}$ inch.	Brass-Plated Front, Strike and Bolt	\$3.50

Above furnished with **NICKEL-PLATED FRONTS AND BOLTS**, to order, at same list.

Discount on all the above, same as corresponding Locks, with regular finish.

We would also call attention to our large and constantly increasing variety of **LOCKS, LATCHES, HINGES, AND BUILDERS' HARDWARE** generally. Supplementary Sheets to our Illustrated Catalogue will be forwarded to those having copies of our catalogue the present week.

Failures in 1876.

The mercantile agency of Dun, Barlow & Co. have just issued their annual statement of failures in the United States and Canada. It appears that the amount of failures in the United States, in 1876, was \$191,117,786, against \$201,060,353 in 1875. The amount is certainly extraordinarily large; but the fact that it is less than in the preceding year by \$10,000,000, and that the number of suspensions occurring in the last quarter of the year shows a marked decrease, indicates that we are at last getting over the worst effects of the panic upon credits. The number and the money amount of failures occurring in the United States and in Canada for the last five years have been as follows:

	United States.	Canada.
1876.....	\$191,117,786	\$25,517,000
1875.....	\$201,060,353	\$28,843,000
1874.....	\$155,339,000	7,696,000
1873.....	\$228,492,000	14,534,000
1872.....	131,056,000

The failures in Canada for the two last years are much larger, *pro rata* to population, than in the United States. In 1876, the failures in the United States averaged \$4,244,000 to every million of population; while in Canada the rate was \$6,379,000 to each million; and in 1875 the proportion was in about the same ratio. If the same had prevailed in this country as in Canada, the failures of last year would have amounted to \$287,000,000, or \$96,000,000 above the actual amount. The average amount of indebtedness last year in each failure is much lower than for many years previous, as will be illustrated by the following statement, in which, for the sake of comparison, the failures in New York City are separated from those of the entire country:

	1876.		1875.	
	No.	Average	No.	Average
	fail's.	liabilities.	fail's.	liabil's.
United States....	9,093	\$21,020	7,740	\$25,960
New York City....	887	\$7,479	951	51,769

	1874.		1873.	
	No.	Average	No.	Average
	fail's.	liabilities.	fail's.	liabil's.
*United States.....	5,830	\$26,637	5,183	\$44,085
New York City....	645	50,510	644	143,843

	1872.	Average liabilities.
United States.....	4,069	\$29,906
New York City.....	385	\$8,724

We quote the following from the circular:

"It may be interesting to discover in what sections of country the financial pressure has been the most severe, and with that view the following table is presented. Under the head of 1876 the number of columns are amplified, which want of space prevents in other years, but the figures, as a whole, will be sufficient to form a basis for comparison:

	1876.	No. in fail.	No. of Amount Averz.
N. E. States.....	77,559	1,314	1 in 59 \$37,657,062 \$28,628
Mid. States.....	165,184	2,909	1 in 57 72,244,681 24,800
West. States.....	225,909	3,129	1 in 74 52,570,541 16,843
S. States.....	87,140	1,361	1 in 64 23,083,366 16,900
Pac. States.....	21,313	999	1 in 60 3,292,226 14,261
Canada.....	54,000	1,728	1 in 32 23,517,991 14,767

	1875.	No. of Amount	1874.	No. of Amount
N. E. States.....	1,335	\$40,015,154	780	\$15,545,000
Mid. States.....	2,395	\$4,622,346	2,035	\$2,081,000
West. States.....	1,909	\$3,948,354	1,744	\$3,073,000
South. States.....	1,333	\$6,277,777	1,126	\$6,690,000
Pacific States.....	377	\$3,585,610
Canada.....	1,938	\$5,845,987	966	\$7,695,765

"An examination of the above table confirms the impression which has been very general, that trade in the Western and Southern States has been less disastrous than that of the Eastern and Middle States. It is a significant circumstance that the failures in the Middle States are one in every 57 names reported in business, while in the Western States the proportion is one in every 72; but the comparison between the East and the South is even more significant, for in New England, with all its wealth and solidity, one in every 59 has yielded to the pressure of the times, while in the South, with all its poverty, its political and other disabilities, the percentage of failures is only one in every 64. Even in Canada, where there is a gold basis, light taxation, freedom from political complications, and all other favoring conditions, the above showing is indicative of much greater pressure than in the United States, the failures in the Dominion being one in every 32. In England no very accurate figures are obtainable, and none of course as yet for the past year, but for 1875 a return was made of 1700 failures among 60,000 firms prominent in trade, indicating one failure for every 36 firms reported in business, with an average liability of \$87,870. The figures for the United States, showing a failure of one in every 63, with an average liability of \$31,000, indicate that the pressure of the times has been either not so great in this country as elsewhere, or that it has been borne with less disastrous results."

Of the failures of the year in Great Britain Ryland's Iron Trade Circular says:

"A writer possessing something of a statistical turn of mind has been at the trouble to sum up the mercantile failures in the United Kingdom during the past year. The list is rather appalling, since there were no fewer than 2065 failures in the different branches of trade—financial, wholesale and manufacturing. By far the larger proportion of these represent engineers, founders, iron, metal and hardware manufacturers and merchants, and the number of failed firms in this category, we observe, is considerably in excess of any previous year since 1872. The figures during the last five years show the number of failures to be as follows, namely: 1872, 1326; 1873, 1745; 1874, 1751; 1875, 1736; and 1876, 2065. Dealing exclusively with the latter year we find London claiming 557; Liverpool, 87; Manchester, 128; Lancashire, 90; Yorkshire (excluding Middlebrough and Hull), 287; Birmingham and Midland iron district, 182; Newcastle, Middlebrough, Hull and district, 90; Bristol, Cardiff, Newport and Swansea, 90; rest of England, 379; Scotland, 132; Ireland, 37. These results exhibit unmistakable evidence of diminished production and keener competition in almost every branch of manufacture, but more especially in the iron and metallurgical industries."

AMERICAN SCREW CO.,

Providence, R. I.

Manufacturers of

IMPROVED
Gimlet Pointed Wood Screws,
Patented

May 30,

1876.

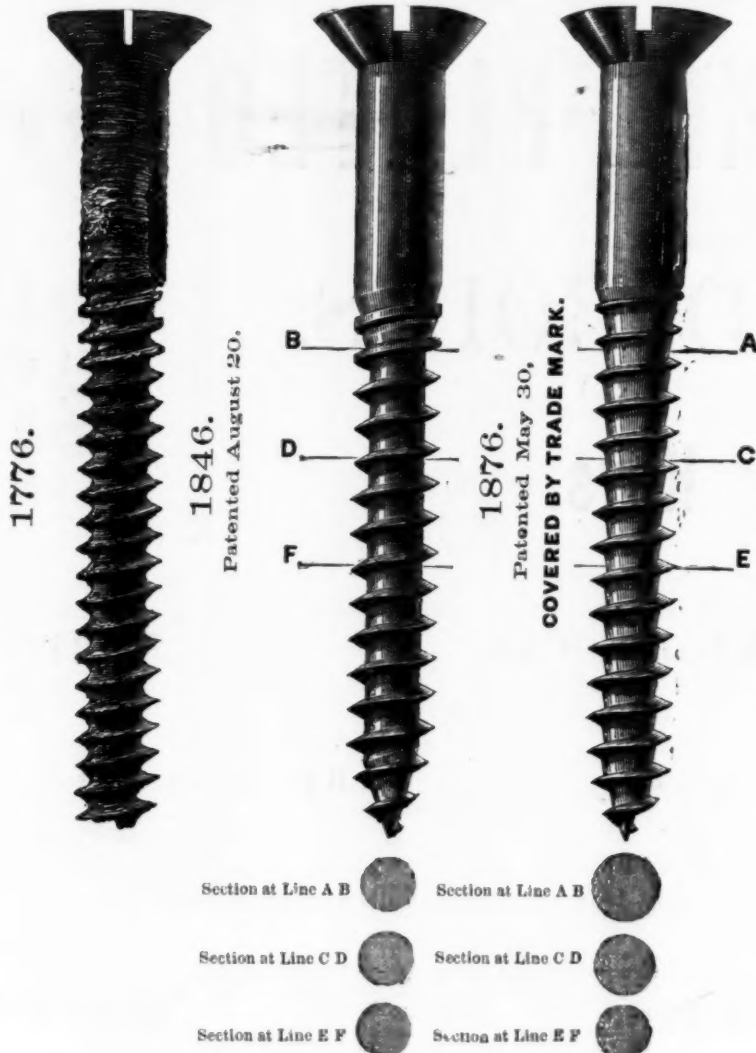


After forty years' experience we offer to the trade our Centennial Screw, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at same price as the old style screw.

The new screws will be packed in manila colored boxes with new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade mark, which is also secured to us.



Estimated to be FIFTY PER CENT. stronger than a screw as commonly made.

The above drawings show the progress of screw making from the old blunt point to style now adopted.

Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

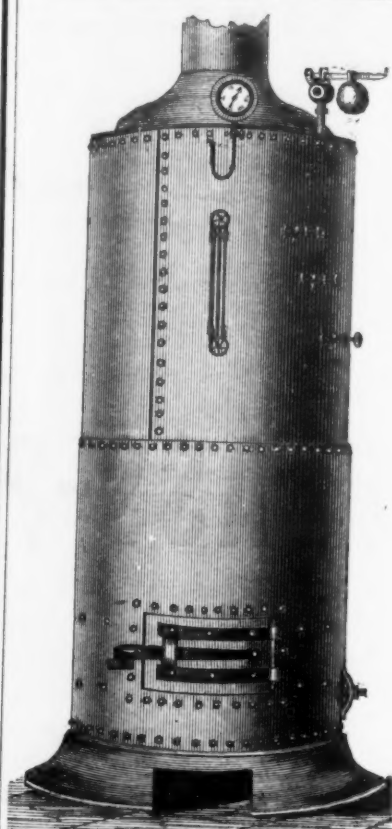
It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated above. See sections at lines.

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"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

Improvement in Rolling Rails.

The Youngstown Tribune has the following interesting item: About four years ago Mr. John H. Jones, of this city (Youngstown), obtained a patent that is destined to become of great importance in the manufacture of rails. Owing to lack of capital, the introduction of this has been slow, but at last the necessary rolls have been completed, and on Thursday, 22th, they were carefully tested at the Girard Rolling Mill. There were present a large number of practical iron men and workers, and the admiration with which they viewed the test is the best evidence of its success. It was found that these rolls will bring a worn out rail back to its original size or reduce it to a smaller size for narrow gauge or mining purposes. This was done without changing the properties of the rail from its original construction. In the test an old rail of 50 pounds to the yard was reduced to 12 pounds to the yard, in one heat, with perfect ease. It is claimed that by adopting the same principle in the construction of rolls a steel rail can be rolled into a billet for any purpose without leaving a crease in it. Mr. Jones proposes soon to give another test of his rolls when all interested in the improvement will be invited.



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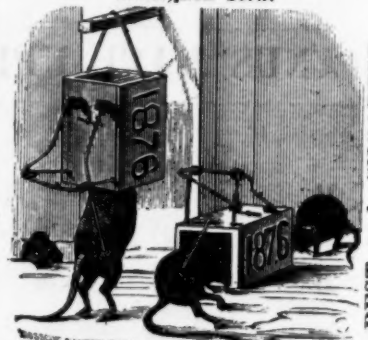
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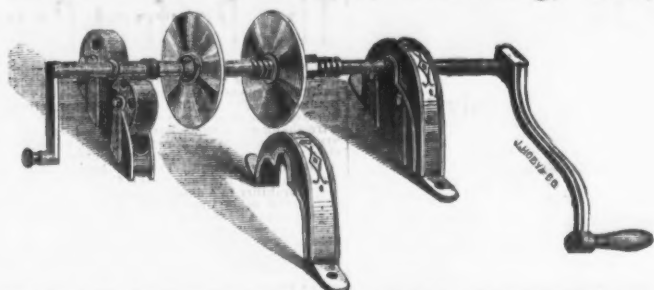
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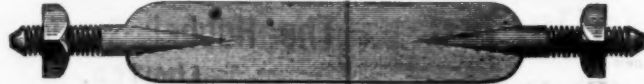
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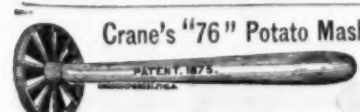


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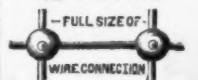
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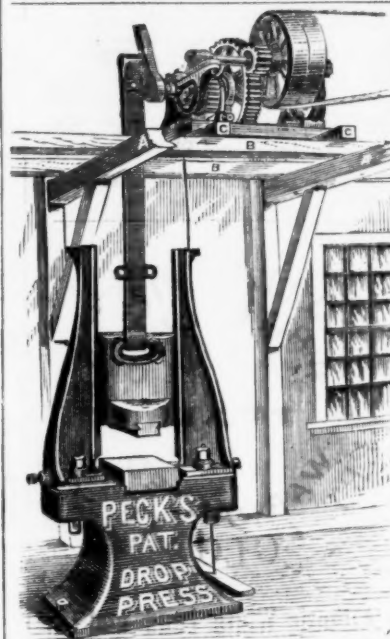
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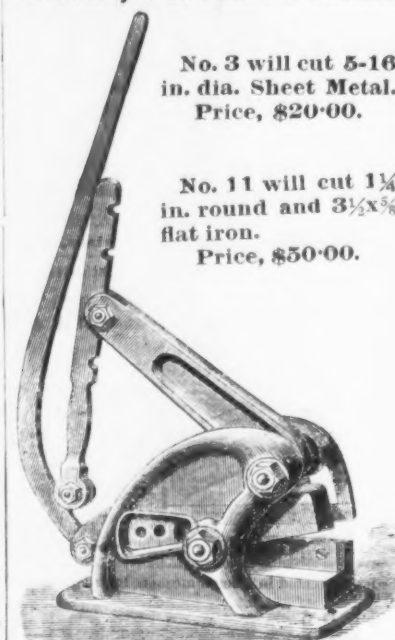
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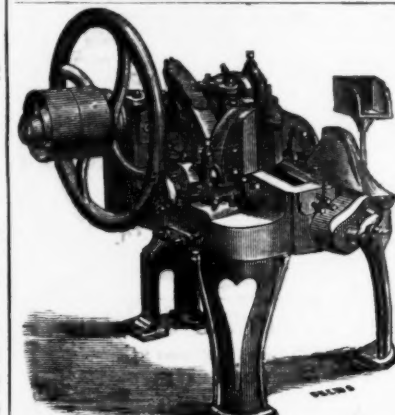


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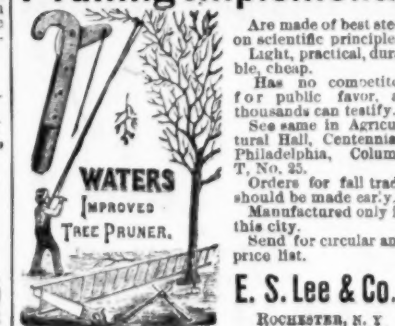
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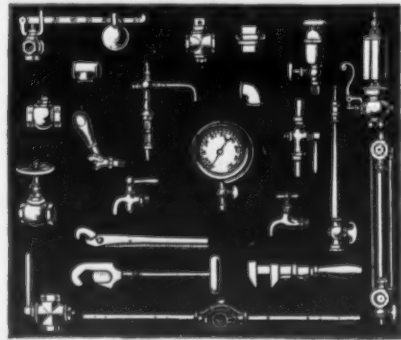
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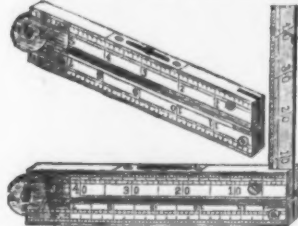
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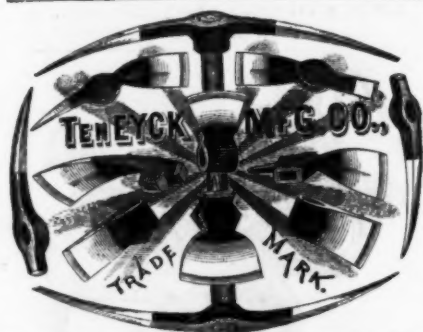
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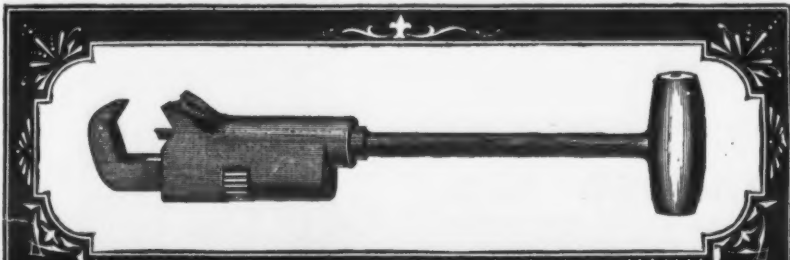
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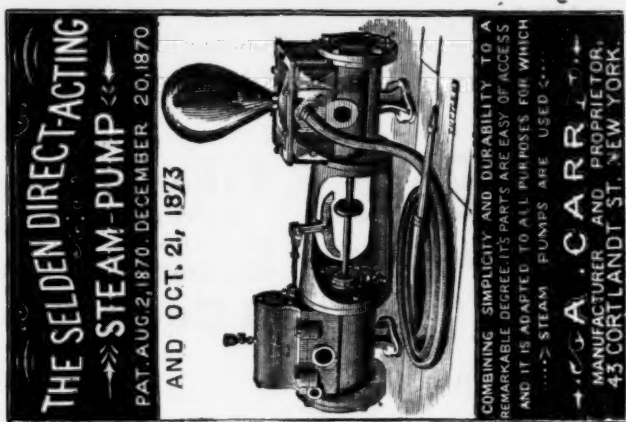


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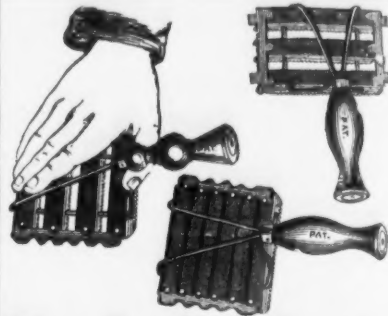
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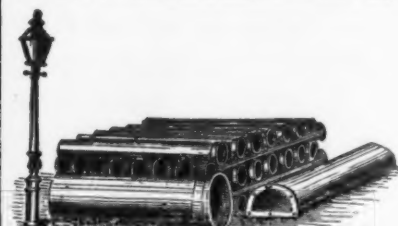
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Borax.	
Theriot Chas. & Co., New York.	6
Pope Thomas J. & Co., 292 Pearl, N. Y.	4
Brass, Manufacturers of.	
Anolis Brass and Copper Co., 19 Cliff, N. Y.	2
Brass Goods Mfg. Co., 200 Pearl, N. Y.	2
Carroll John & Sons, 100 John, N. Y.	2
Holmes, Booth & Haysden, 49 Chambers, N. Y.	2
Manhattan Brass Co., 43 Reade, N. Y.	2
Miller Edw. & Co., 20 Barre, N. Y.	2
Pine & Atwood Mfg. Co., 80 Chambers, N. Y.	2
Scull Mfg. Co., 421 Broome, N. Y.	2
The Wilcox Mfg. Co., 124 Chatham, N. Y.	2
Bridgeport, Conn.	2
Waterbury Brass Co., 92 Beekman, N. Y.	2
Brick Presses.	
Carroll F. L. & D. R., 184 Germantown Ave., Phila.	32
Bridge Ladders.	
Steel Iron Bridge and Roof Co., 5 Der, N. Y.	5
Leachon Bridge and Iron Works, Rochester, N. Y.	5
Brushes (Wheel).	
Greaser P. M., 117 John, N. Y.	31
Butcher and Sausage Knives, Manufacturers of.	
Wilson John, Sheffield, England.	37
Butcher's Machinery.	
Forman Chas., 41 Bridgeport, N. Y.	37
Buttons and Hinges.	
American Spring Button Co., 32 Beekman, N. Y.	44
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Sample & Birge Mfg. Co., St. Louis, Mo.	44
Union Mfg. Co., 95 Chambers, N. Y.	44
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Dunlop J. S., Peoria, Ill.	7
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Harden & Smith, Auburn, N. Y.	13
Smith H. D. & Co., Cantonville, Ct.	13
Carrington Springs.	
Reed John H. & Co., Newark, N. J.	37
Car Conveyors.	
Lahay John H., Reading, Pa.	41
Car Wheels, etc., Manufacturers of.	
Taylor Iron Works, High Bridge, N. J.	4
Cast Iron, Manufacturers of.	
Carver John, 281 Monroe, N. Y.	4
Chisels, Manufacturers of.	
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Coal, Miners of.	
Lehigh Valley Coal Co., Cor. Courtlandt and Church,	37
N. Y.	
Pardee A. & Co., 111 Broadway, N. Y.	37
The Hoboken Coal Co., Jersey City, N. J.	37
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Compound Cast.	
Hornbostel Cast, 56 Barre, N. Y.	3
Copper's Tools, etc., Dealers of.	
D. R. Barton Tool Co., Rochester, N. Y.	13
Cotton Shells.	
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Cotton Gins.	
Rumsey & Co., Seneca Falls, N. Y.	32
Cottonized Iron.	
Modeler Iron Bridge and Roof Co., 5 Der, N. Y.	5
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The Brown Cotton Gin Co., New London, Conn.	42
Cranes, Manufacturers of.	
Wile, St. del & Co., 709 Market, Phila.	42
Cutlery, Manufacturers of.	
Cassell I. N., 1200 Broadway, N. Y.	31
Holmes & Co., Bridgeport, Conn.	31
Lawrence Curry Comb Co., 824 2d Avenue, N. Y.	31
Cutlery, Importers of.	
Baker Hermann & Co., 101 Duane, N. Y.	31
Claworthy J. W. & Co., 28 Chambers, N. Y.	31
Cher Jos. S., 41 Cornhill, Phila.	31
Friedman & Lantiering, 14 Warren, N. Y.	31
King, Bridges & Co., 80 Chambers, N. Y.	31
Meriden Cutlery Co., 40 Chambers, N. Y.	31
Cutlery, Manufacturers of.	
American Shear Co., Hertschelsville, Conn.	11
Parsons Aaron, Fenner, Mass.	11
John Russell Cutlery Co., Canton, N. Y.	11
Miller Bros. Cutlery Co., W. Meriden, Conn.	11
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N. Y.	
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Am. Dredging Co., 10 S. Delaware Ave., Phila.	43
Drill Chucks, Manufacturers of.	
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Lambertville Iron Works, Lambertville, N. J.	42
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De Baun H. G., 179 William, N. Y.	28
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Car J. & Riley, 82 John, N. Y.	31
Flaser Joseph S., 411 Commerce, Phila.	11
Fraser Peter & Co., 36 Fulton, N. Y.	34
Moss F. W., 10 John, N. Y.	34
Sanders Bros. & Co., 16 Cliff, N. Y.	36
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Shepard Sidney & Co., Buffalo, N. Y.	12
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King, Bridges & Co., 80 Chambers, N. Y.	37
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Wilson Mfg. Co., 95 Chambers, N. Y.	44
Hardware Specialties.	
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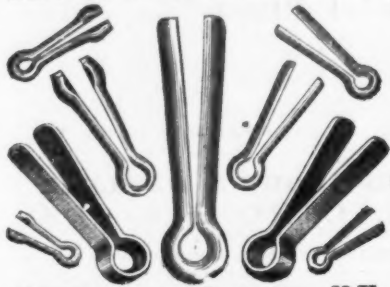
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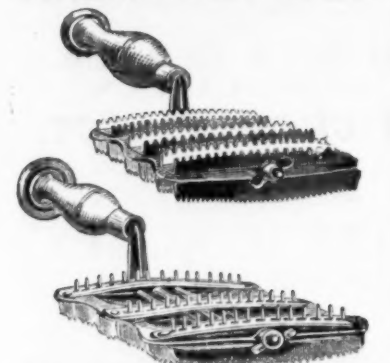
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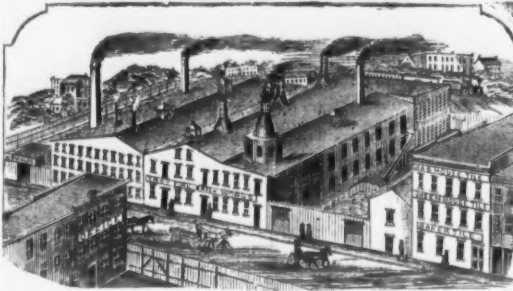
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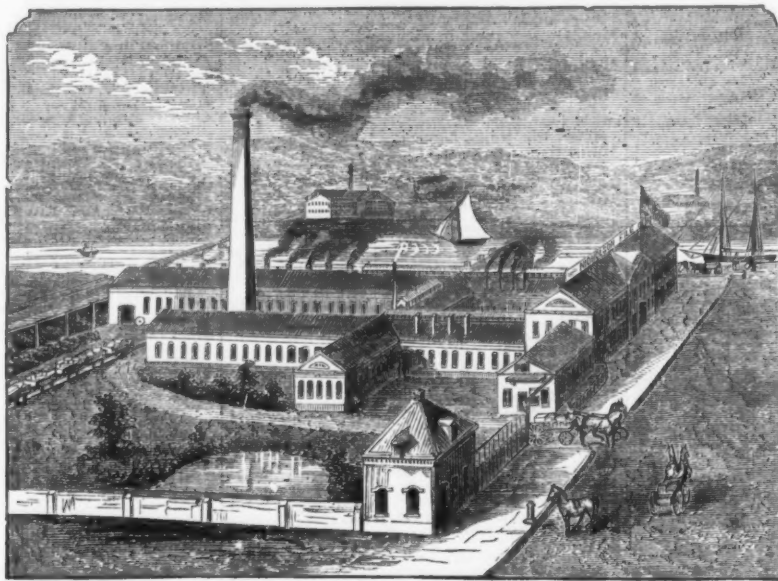
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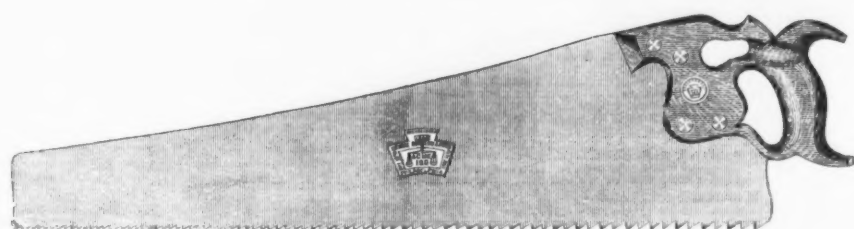
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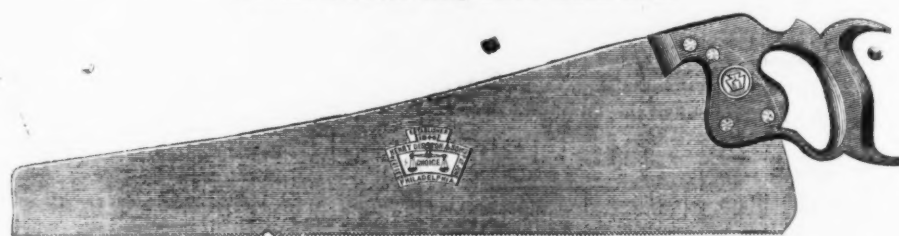
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For Prices see our Revised Discount Sheet, dated January 1st, 1877.

A Few of Our CELEBRATED HAND SAWS, Etc.



Patent Double Grip Skew Back Saw.



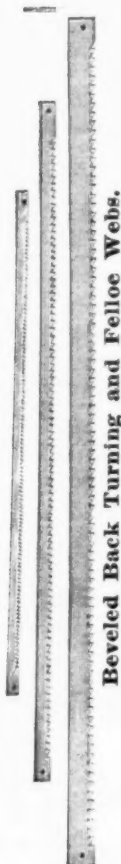
Patent Skew Back "Choice," No. 80.



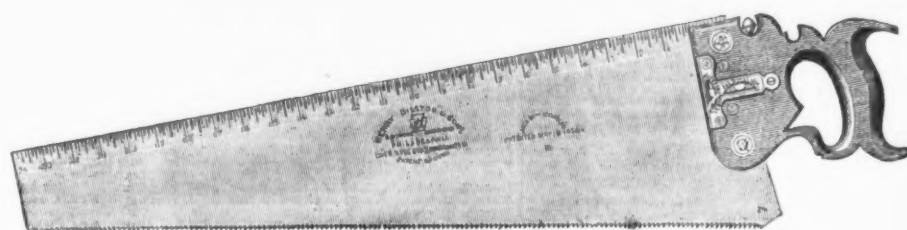
Patent Skew Back, No. 76.



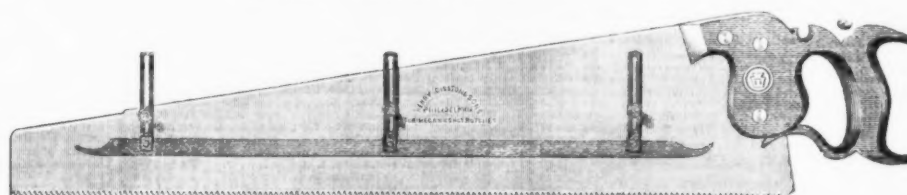
No. 7 Hand Saw.



Beveled Back Turning and Felloc Webs.



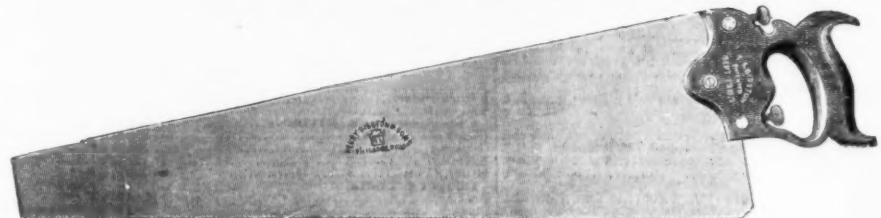
Patent Improved Combination Saw.



Patent Gauge Saw, Quality No. 7.



Patent Combination Saw, No. 29.



Hand Saw with Patent Adjustable Handle.

BUTCHERS' BOW BACK SAWS.



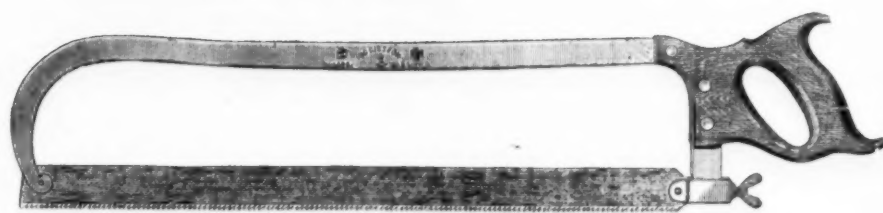
No. 1, California Flat Steel Back, Clock Spring Blades.



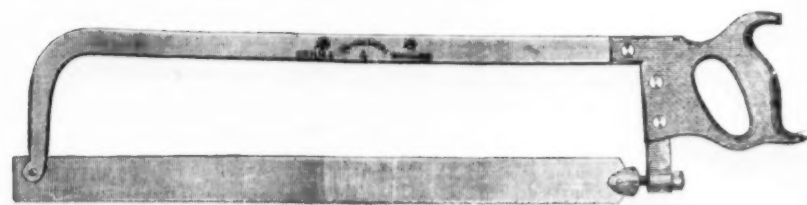
No. 2, California Oval Steel Back. Sizes, 16 to 24 inches.



Pork Packers' Saws. Sizes, 14 to 18 inches.



No. 3, Flat Back. Sizes, 16 to 24 inches.



No. 4, Flat Back. Sizes, 16 to 24 inches.

New York Wholesale Prices, January 31, 1877.

HARDWARE.

[illegible][illegible][illegible]

Wrought Strap and F.	Price according to	dia 63d 10
Providence Plate, 1 1/2 to 10 in. 11c W & B		dia 60c 10
Brew Hook and Strap	15, 10, 12 in. 11c	dia 60c 10
Heavy Welded Hook	14 to 36 in. 11c	dia 60c 10
Screw Hook and Eye	14 in. & up, 9 1/2c	dia 40c 5
Screw Hook and Eye	1 1/2 to 1 in. 9 1/2c	dia 40c 5
Screw Hook and Eye	1 1/2 in. 11 1/2c	dia 40c 5
Hoses		
Solvent Hanks, C. S.	per doz \$3 00—dia 35	
Solvent Hanks, C. S.	per doz \$3 00—dia 35	
Riveted Eye	per doz \$3 00—dia 35	
Planters	dia 80c 10	
Seev's Pattern	dia 25c 10	
Hoops		
Bird Cage	dia 60c 10 @ 70c 10	
Cotton	dia 50c 10	
Wenton's No. 1, \$8 00	per doz \$7 00	dia 60c 10
McGill's	per doz \$6 25	dia 60c 10
Clothes Line	dia 60c 10 @ 70c 10	
Reading list	dia 60c 10 @ 70c 10	
Celling	dia 60c 10 @ 70c 10	
Harness	dia 60c 10 @ 70c 10	
Coat and Hat, Har's list	dia 60c 10 @ 70c 10	
Sargent's list	dia 60c 10 @ 70c 10	
Wrought Staples and Hooks and Staples	dia 75c 10	
Wire across Hooks and Eyes	dia 60c 10 @ 70c 10	
Grass	dia 60c 10 @ 70c 10	
Whimtree-Patent	dia 60c 10 @ 70c 10	
Hicks and Brass	dia 60c 10 @ 70c 10	
Horse Nails		
No. 5	per doz \$3 00	dia 60c 10
No. 6	per doz \$3 00	dia 60c 10
No. 7	per doz \$3 00	dia 60c 10
P'd & P'd.	per doz \$3 00	dia 60c 10
Cortland	per doz \$3 00	dia 60c 10
Buffalo Forged	per doz \$3 00	dia 60c 10
Globe, P'd & P'd.	per doz \$3 00	dia 60c 10
Polished, Pat. Fin.	per doz \$3 00	dia 60c 10
National, Pointed and	per doz \$3 00	dia 60c 10
Perkins' P'd & P'd.	per doz \$3 00	dia 60c 10
Perkins' Black and	per doz \$3 00	dia 60c 10
Perkins' Pointed and	per doz \$3 00	dia 60c 10
Blued	per doz \$3 00	dia 60c 10
Vulcan, P'd & P'd.	per doz \$3 00	dia 60c 10
Strand, Laid, Morgan	per doz \$3 00	dia 60c 10
Usable, National and New London	per doz \$3 00	dia 60c 10
Perkins and Vulcan	per doz \$3 00	dia 60c 10
Perkins and Globe	per doz \$3 00	dia 60c 10
Horse Shoes		
Burden	per doz \$4 00	dia 60c 10
R. L. Horse Shoe Co., Perkins' Improved Light	per doz \$4 00	dia 60c 10
Mule Shoes	per doz \$4 00	dia 60c 10
Perkins' Snow	per doz \$4 00	dia 60c 10
Boston Rolling Mills	per doz \$4 00	dia 60c 10
Ice Awns, Chains, &c.		
American Ice Chain	per doz \$6 00	dia 60c 10
Novelty Ice Breakers	per doz \$6 00	dia 60c 10
White's Sliding Hand Picks	per doz \$7 25	dia 60c 10
Wood Head Picks	per doz \$1 25	dia 60c 10
Iron	per doz \$1 25	dia 60c 10
Ice Mallets, Pick in Hand	per doz \$3 00	dia 60c 10
Ice Axes	per doz \$3 00	dia 60c 10
Kettles		
Enamelled	per doz \$4 00	dia 60c 10
Knives		
Ames' Butcher Knives	per doz \$4 00	dia 60c 10
Bread	per doz \$1 00	dia 60c 10
Hay and straw, "Wadsworth's"	per doz \$1 00	dia 60c 10
Tool Pocket	per doz \$1 00	dia 60c 10
Knobs		
Carriage (Jap'd 80 cents per gross)	per doz \$1 00	dia 60c 10
Base—Common	per doz \$1 00	dia 60c 10
Elastic End, No. 8	per doz \$1 00	dia 60c 10
Door, Mineral	per doz \$1 00	dia 60c 10
For	per doz \$1 00	dia 60c 10
Plated	per doz \$1 00	dia 60c 10
For	per doz \$1 00	dia 60c 10
Furniture, Plain	per doz \$1 00	dia 60c 10
Ladies		
Melting, Har's list	per doz \$1 00	dia 60c 10
Sargent's	per doz \$1 00	dia 60c 10
Reading	per doz \$1 00	dia 60c 10
Monroe's Patent	per doz \$1 00	dia 60c 10
Lampers		
Tabular, No. 0, \$11 00; No. 1, \$14 00	per doz \$1 00	dia 60c 10
Beccia	per doz \$1 00	dia 60c 10
Brady's Patent	per doz \$1 00	dia 60c 10
Etina	per doz \$1 00	dia 60c 10
Yankee	per doz \$1 00	dia 60c 10
Police	per doz \$1 00	dia 60c 10
Lard Presses		
Draw Cut 1 inch	per doz \$1 00	dia 60c 10
Lemon Squeezers		
Porcelain Lined	per doz \$1 00	dia 60c 10
Stainless Steel	per doz \$1 00	dia 60c 10
Lines		

[illegible]

Chalk, English, 30¢
Block, 30¢
Dryer, Patent, Am'g, 30¢
Flocks, 30¢
Frosting, 30¢
Glue, White, 30¢
Glassers Points, Zinc, 30¢
Gum, Copal, 30¢
Damar, 30¢
Stearic, 30¢
Dark, 30¢
Litharge, 30¢
Sheet, 30¢
Powdered, 30¢
Pumice Stone, selected, 30¢
Rotton Stone, soft, English, 30¢
Spiritus Turpentine, 30¢
Whiting, special, 30¢

FRENCH WINDOW GLASS.
Prices current per box of 50 feet.

SIZES.		1st.	2d.	3d.	4th.
6 x 8	to 10 x 15.	\$ 7.50	\$ 6.75	\$ 6.25	\$ 5.75
11 x 14	to 16 x 24.	8.50	7.75	7.25	6.75
18 x 24	to 30 x 30.	10.75	9.75	9.25	8.75
15 x 30	to 21 x 30.	12.25	10.75	9.00	7.75
26 x 36	to 34 x 36.	18.00	11.90	9.75	8.50
36 x 36	to 44 x 44.	24.00	14.25	10.75	9.50
36 x 46	to 50 x 50.	30.00	14.00	11.25	10.00
30 x 52	to 30 x 54.	16.00	14.50	12.00	11.00
30 x 54	to 34 x 54.	17.50	15.50	13.00	12.00
34 x 56	to 34 x 60.	18.25	17.25	15.00	14.00
36 x 60	to 40 x 60.	20.75	18.75	17.25	16.00

Double Thick.

SIZES.		1st.	2d.	3d.	4th.
6 x 8	to 10 x 15.	\$12.00	\$11.00	\$10.00	\$ 9.25
11 x 14	to 16 x 24.	13.75	12.50	11.75	10.50
18 x 24	to 30 x 30.	17.25	15.75	14.00	12.50
15 x 30	to 21 x 30.	19.75	17.25	15.50	14.00
26 x 36	to 34 x 36.	21.00	19.00	15.75	14.50
36 x 36	to 44 x 44.	28.25	21.25	17.25	16.00
36 x 46	to 50 x 50.	34.00	22.50	18.00	17.00
30 x 52	to 30 x 54.	23.75	20.45	19.25	18.00
30 x 54	to 34 x 54.	25.75	23.00	21.75	20.50
34 x 56	to 34 x 60.	26.25	24.75	23.00	21.50
36 x 60	to 40 x 60.	33.25	30.00	27.75	26.00

Sizes above 40 x 60—10.00 per box extra for every five inches.

An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 34 inches in length, and not making more than 81 uncut inches, will be charged in the 34 uncut inches bracket.

Discount 50c to 15.

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Merchants, Buffalo, N. Y.
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POST HOLE AUGER.

Durable, and the handiest Earth Auger in market. Bore three holes while any other Auger in boring works readily in clay, sand, gravel, or muck soil, or root sods without the use of shovel or spade to clear the hole.

Others in use are easily broken, bent and disabled, under strong pressure. The "Fletcher" Auger will cut its peculiar construction enables it to cut by such a manner as to push itself speedily and



is drawn from the hole: it brings all the dirt and mud to the surface. *Strongly made, simple and handy in manner of cutting.* Always ready for use. In market, and we offer to the trade a liberal discount on cash orders. Retail price, net, \$3.50 each. Each. Less 50 per cent.

CO., New York Agents.

BRIDGE & CO.,
100 N. 3rd St., NEW YORK.



in., ½ in. plates. Shears for Plates and Bars.
Hand and Power
PUNCHING PRESSES
 Steel, adapted for all trades.
AGENTS WANTED.

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STAMPING WORKS.



MAKERS OF
AND JAPANNED
WARE.
 Toys, Coal Hods, Pat. "Palace"
 Boards, "Champion" Ice Cream
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 Tin Ware.
 House Furnishing Hardware.

& CO., Buffalo, N. Y.

Steel.

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IRON AND STEEL.

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RELS, MOULDS AND ORDNANCE.

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"EXTRA" CAST STEEL, SHEAR, SHEET AND
BLISTER STEEL.

Best Cast Steel Wire Rods and Steel Wire of the finest quality for all Purposes.
Sole makers of COCKER'S "METEOR" WIRE PLATES.

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WARRANTED CAST STEEL, especially adapted for DIES and TURN-
ING TOOLS, DRILLS, COLD CHISELS,
PUNCHES and all kinds of MACHINISTS' TOOLS.
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools,
warranted not to crack in hardening. Taps of any size.
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Huntington, Hopkins & Co., San Francisco and
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Warranted most SUPERIOR and UNSURPASSED for
TOOLS and GRANITE ROCK DRILLS.

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Manufacturers of Every Kind of Steel Wire.

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MANUFACTURERS OF ALL KINDS OF

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Also, Springs, Axles, Rake Teeth, &c.

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Steel Locomotive Tires. Steel Axles of every description.

STEEL FORGINGS UP TO 8000 lbs. IN WEIGHT.

Solid Steel Castings, Hammer Dies, Frogs, Crossings, etc.

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Patented August 1st, 1876.

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Patent Rolled

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Special Steel

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LATHES, PLANERS, &c.

Turns out at least double work by increased speed

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Steel. Neither hardening nor tempering required.

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Sporting, Shipping, and Mining
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ESTABLISHED IN 1801,

Have maintained their great reputation for 75

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Celebrated Eagle Ducking,

Eagle Rifle, & Diamond

Grain Powder.

THE MOST POPULAR POWDER IN USE.

Also, SPORTING, MINING, SHIPPING, AND BLAST-

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LAFLIN & RAND POWDER CO.,

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Invite the attention of the Hardware Trade to their

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In every part of the United States.

From having agencies and magazines at all prom-

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Schaghticoke, N. Y.; Moosic, Rush-

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Platteville, Wis.

The superiority is well known of our brands of

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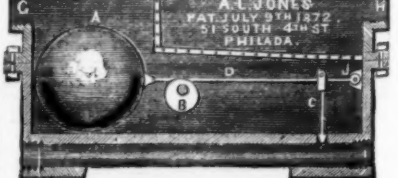
Orange Rifle, Orange Ducking,

Orange Lightning.

ELECTRIC BLASTING APPARATUS.

SAFETY-FUSE at wholesale.

HIGHEST MEDAL AWARDED.



PATENT IMPROVED STEAM TRAP.

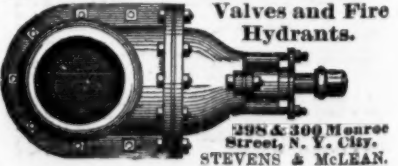
The only self-regulating Steam Trap in the world.

For full description send for circular to

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Valves and Fire

Hydrants.

228 & 300 Monroe

Street, N. Y. City.

STEVENS & McLEAN.

Steel.

THE EDGAR THOMSON STEEL CO., LIMITED.

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STEEL RAILS, BLOOMS & INGOTS

General Office and Works at Bessemer Station (Penn. R. R.), Allegheny County, Pa.

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The members of the Edgar Thomson Steel Company, Limited, have had large experience in manufacturing and in railway management; their works are the most complete in the world, with all the latest improvements, and are located in the best Bessemer metal district in the United States, and their managing officers are experienced in the manufacture of Bessemer Steel.

The Company warrants its rails equal in quality to any manufactured in the United States.

Rails of any weight or section furnished on short notice. Orders for trial lots solicited.

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D. McCANDLESS, Chairman. W. P. SHINN, General Manager.

S. & C. WARDLOW,

Sheffield, England,

Manufacturers of the Celebrated

Cast and Double Shear STEEL.

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives, Turning Tools, Dies, Files, Clock and other Springs, and Tools of every variety.

Agent in New York, WILLIAM BROWN, 95 John Street.

JOHN WILSON'S CELEBRATED

BUTCHERS' KNIVES,
BUTCHERS' STEELS,
AND
SHOE KNIVES.

THE TRADE MARK, IN ADDITION
TO THE NAME,
IS STAMPED UPON EVERY ARTICLE MANUFACTURED BY
JOHN WILSON.



GRANTED A.D. 1766, BY THE
CORPORATION OF CUTLERS OF SHEFFIELD,
AND PROTECTED BY ACT OF PARLIAMENT.

BUYERS ARE SPECIALLY CAUTIONED AGAINST
IMITATIONS OF THE MARK, AND THE
SUBSTITUTION OF COUNTERFEITS
BEARING THE NAME, "WILSON," ONLY.

Works: SYCAMORE STREET, SHEFFIELD. ESTABLISHED in the Year 1750.

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Proprietors of TRENTON VISE AND TOOL WORKS, Trenton, N. J.—Vices, Picks,

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W. & S. Butcher's Files, Edge Tools and Razors, the largest stock in the United States.

Geo. Wostenholm & Son's Knives, Scissors and Razors, the largest stock in the U. S.

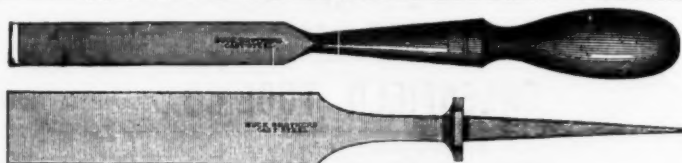
John Wilson's Butcher and Shoe Knives.

Peter Wright's and Armitage Anvils.

We always have on hand a full assortment of

German and English Hardware, Cutlery, Guns, Gun Material,

Chains, Heavy Goods.



BUCK BROTHERS, Millbury, Mass.

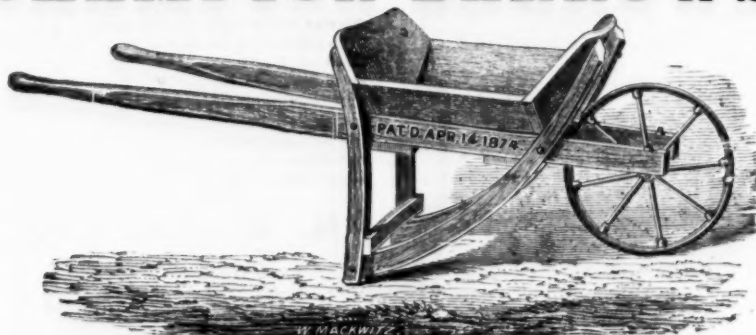
The most complete assortment in the U. S. of Shank, Socket Firmer, and Socket Framing

Chisels.

PLANE IRONS.

Gauges of all lengths, and circles beveled inside or outside. Nail Sets, Scratch and Belt Awns, Chisel
Handles of all kinds. Orders filled promptly; generally same day as received.

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WITH WOOD OR IRON WHEELS.

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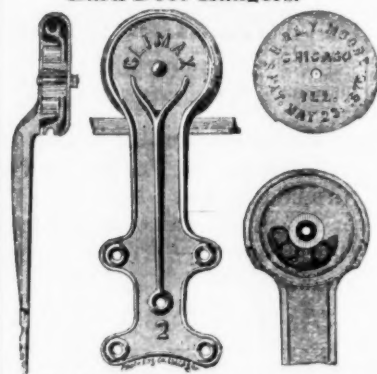
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The "CLIMAX" Hanger is simple and substantial in its construction. A circular cap on the head contains a set of nine chilled iron rollers, within which the hub of the wheel revolves. The rollers do away with the friction and wear on a certain pin which is the objection to the common wheel hangers. In the "Climax" there is the friction of rolling surfaces only. Other hangers have the wheel alone, or the rollers alone; the combination of both in the Climax makes it the easiest running hanger in existence.

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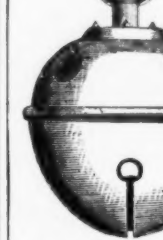
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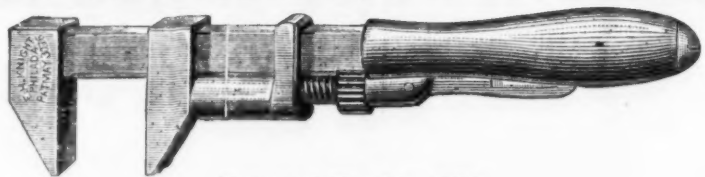
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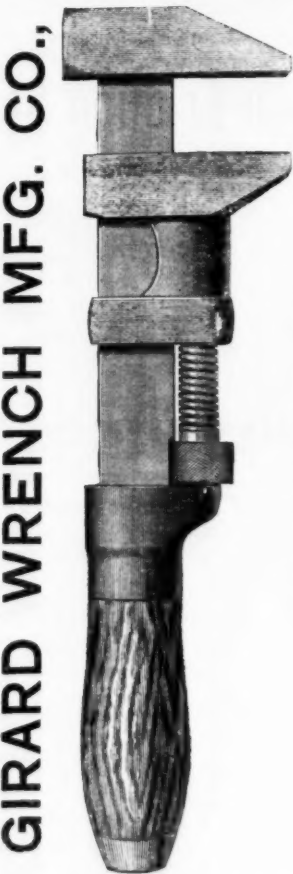
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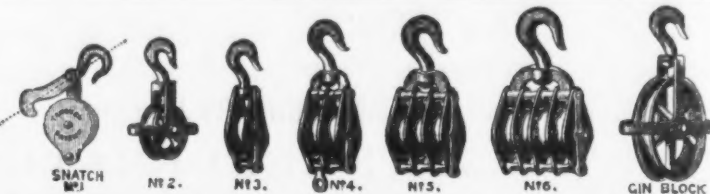
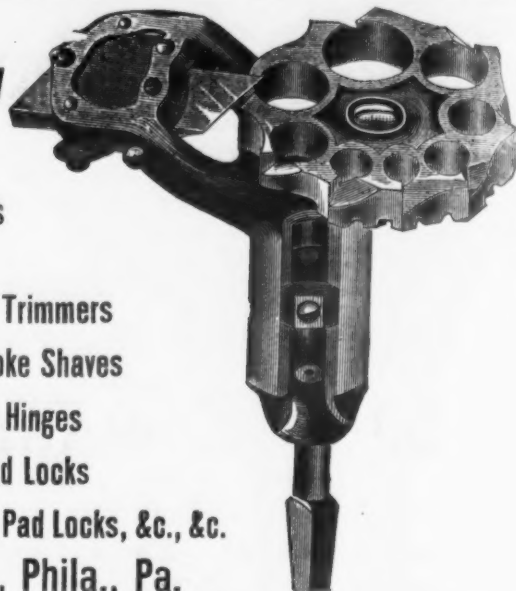
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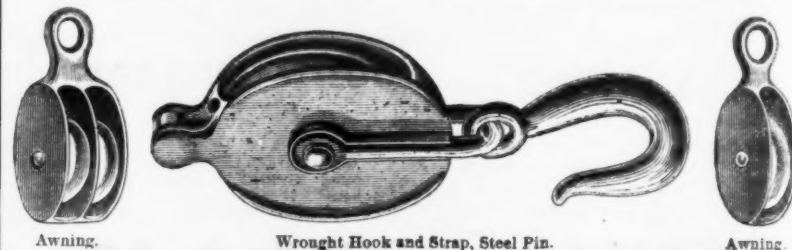
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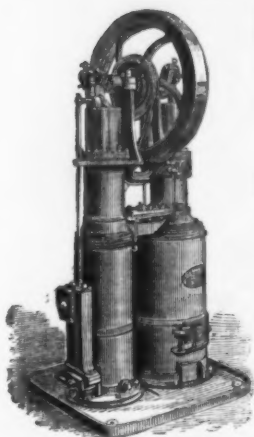
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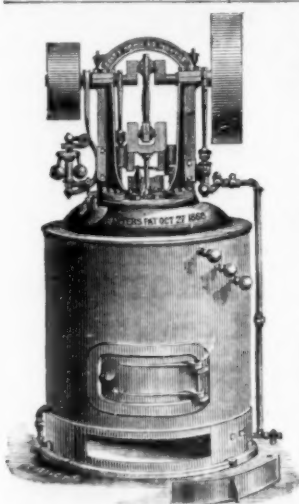
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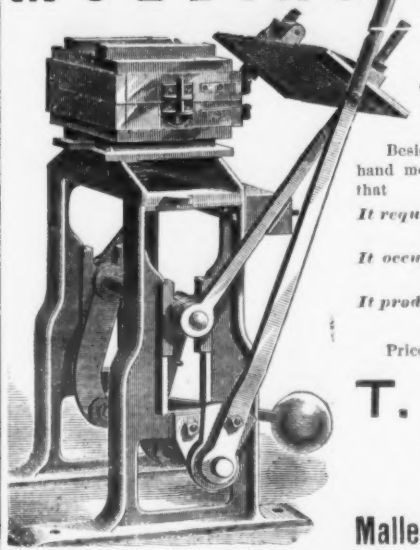
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It occupies no more room than a bench for hand molding.

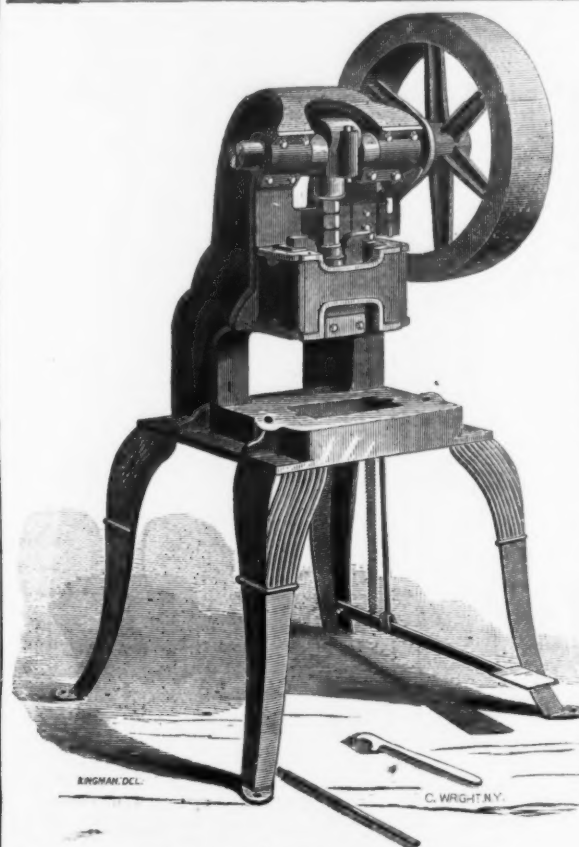
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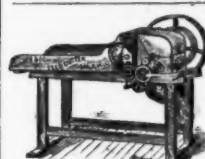
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GOLD MEDAL Non-Extensible Razor Belt.

PATENTED JULY 25, 1871.

RE-ISSUED MAY 13, 1873, and JUNE 9, 1874.

In this Strap the liability of the leather to stretch and become loose and porous is prevented by the use of a patented non-extensible base, which supports the leather and secures

PERMANENT ELASTICITY.

We make this style with single rod, double rod, and wood frames, and intend that it shall, in quality compare favorably with our other well known brands.

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HYDRAULIC JACKS

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For
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On hand and made to order.

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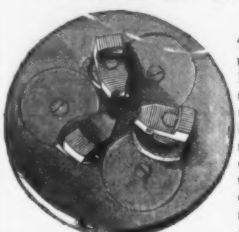
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ESTABLISHED 1852.

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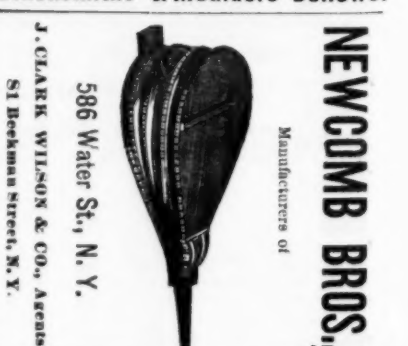
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Reduced Price List,

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For dimensions of Governor, see Illustrated Price List.



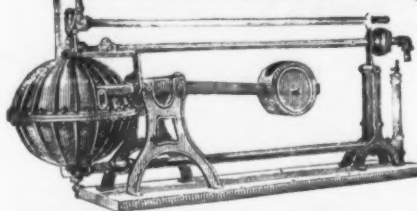
THE JUDSON PATENT Improved Steam Governor.

Size, Inch.	Plain.	Bright Fin.ished.	Extra for Speeder.	Stop Valve.
3/4	\$16.00	\$18.00	\$1.90	..
1	18.00	20.00	1.90	..
1 1/4	20.00	22.00	2.00	\$5.00
1 1/2	23.00	26.00	2.25	6.00
1 3/4	26.00	30.00	2.50	8.00
2	31.00	35.00	2.75	10.00
2 1/4	36.00	41.00	3.25	12.00
2 1/2	40.00	45.00	3.50	14.00
2 3/4	45.00	51.00	3.75	16.00
3	50.00	57.00	4.25	19.00
3 1/4	55.00	62.00	4.50	23.00
3 1/2	59.00	67.00	5.00	28.00
4	69.00	78.00	5.50	34.00
4 1/4	80.00	90.00	6.00	40.00
5	90.00	101.00	6.50	46.00
5 1/4	105.00	117.00	7.00	54.00
6	120.00	133.00	7.50	62.00
7	142.00	156.00	8.00	65.00
8	175.00	192.00	9.00	79.00
9	198.00	218.00	10.00	..
10	210.00	240.00	12.00	..

No Charge for Box and Cartage.

JUNIOR JUDSON & SON, Rochester, N. Y.

The Albany Steam Trap.



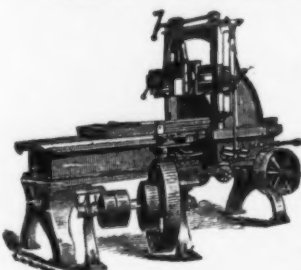
This Trap automatically drains the water of condensation from Heating Coils, and returns the same to the Boiler whether the Coils are above or below the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

Albany Steam Trap Company, Albany, N. Y.

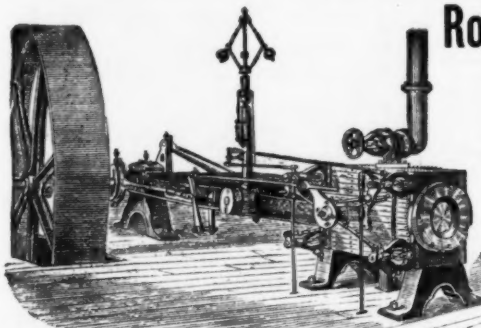
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Shafting & Gearing, Boiler Makers.

THORNE, DeHAVEN & CO., Drilling Machines,

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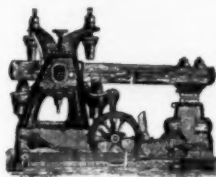
PORTABLE DRILLS. Driven by power in any direction. RADIAL DRILLS. Self-feed—Large Adjustable Box Table. VERTICAL DRILLS. Self-feeding. MULTIPLE DRILLS. 2 to 30 Spindles. HORIZONTAL BORING AND DRILLING MACHINES. HAND DRILLS. CAR BOX DRILLS. SPECIAL DRILLS. For Special Work.

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Western Office, 22 S. Canal St., Chicago, Ill., A. B. BARNES, Manager.

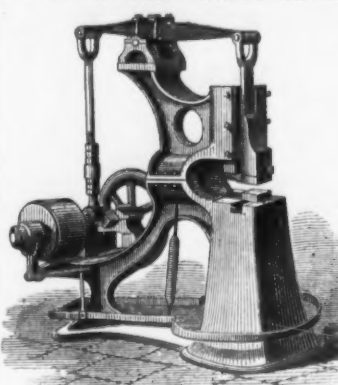
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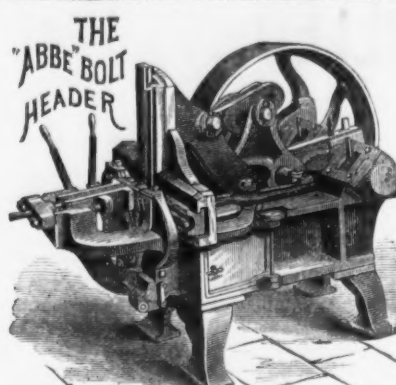
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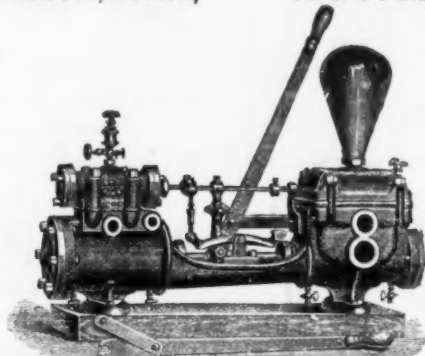
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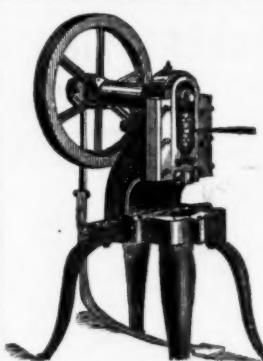
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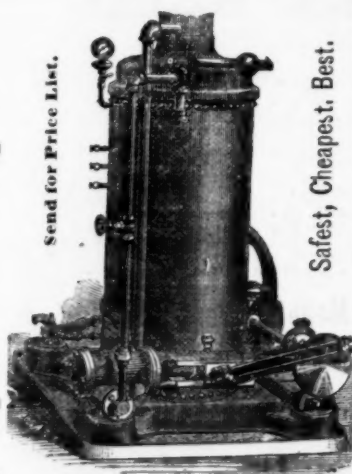
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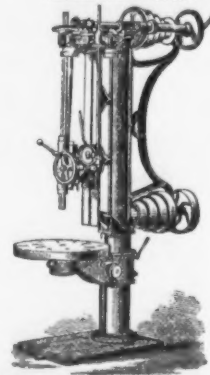
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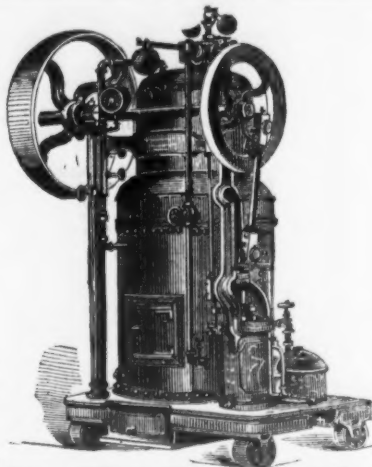
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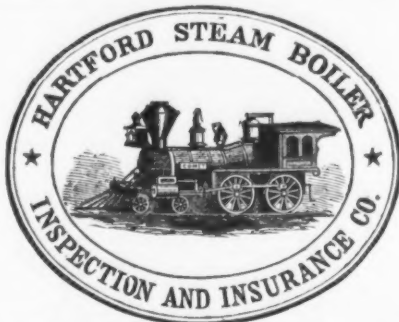
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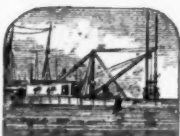
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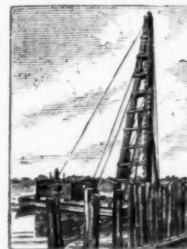
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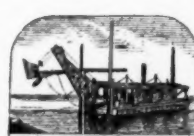
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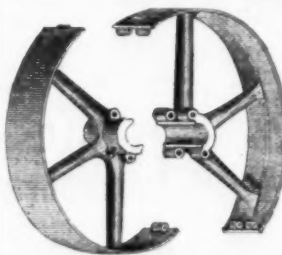
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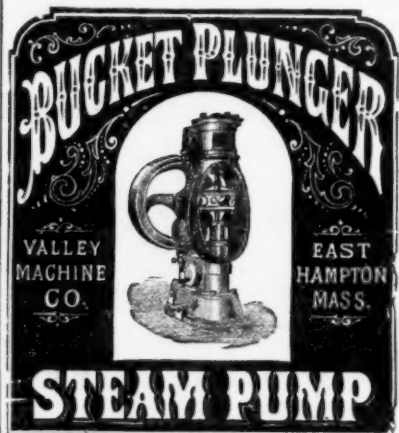
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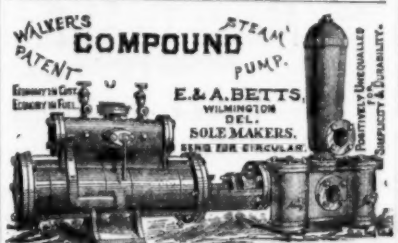
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